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U.S. Department of Energy
Richland Operations Office
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P.O. Box 550, MSIN A2-17
Richland, Washington 99352

Subject: Contract No. DE-AC06-93RL12367
**TRANSMITTAL OF DOCUMENT ENTITLED, "INFORMATION ON WIDS
SITES WITHIN THE 100 AREA FOR THE 100-IU-1 AND THE 100-IU-3
OPERABLE UNITS," (DOE/RL-2002-74, REV. 0)**

Dear Mr. Wisness:

This letter transmits to the U.S. Department of Energy, Richland Operations Office, the following document, "*Information on WIDS Sites Within the 100 Area for the 100-IU-1 and 100-IU-3 Operable Units*," (DOE/RL-2002-74, Rev. 0) for your information and distribution to offsite recipients.

If you have any questions, please contact Mr. S. G. Weiss at 372-9495.

Sincerely,

D. D. Teel, Manager
Natural Resources & Environmental Site Closure

SGW:tlf

Attachment - Document

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Information on WIDS Sites Within the 100 Area for the 100-IU-1 and the 100-IU-3 Operable Units



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Information on WIDS Sites Within the 100 Area for the 100-IU-1 and the 100-IU-3 Operable Units

May 2003



United States Department of Energy

P.O. Box 550, Richland, Washington 99352

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ACRONYMS

2,4-D	2,4-dichlorophenoxyacetic acid
AAA	anti-aircraft artillery
AEC	Atomic Energy Commission
CDM	Camp Dresser & McKee Inc., Federal Programs
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
COC	contaminant of concern
DDE	dichlorodiphenyl dichloroethylene
DDD	dichlorodiphenyl dichloroethane
DDT	dichlorodiphenyl trichloroethane
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERA	expedited response action
FR	<i>Federal Register</i>
GPR	ground-penetrating radar
HEIS	Hanford Environmental Information System
IU	isolated unit
MTCA	<i>Model Toxics Control Act</i>
NPL	National Priorities List
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PPB	parts per billion
PPM	parts per million
QA	quality assurance
RA	remedial action
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
RL	DOE, Richland Operations Office
ROD	Record of Decision
SVOC	semivolatile organic compound
Tri-Party Agreement (also TPA)	<i>Hanford Federal Facility Agreement and Consent Order</i>
TPH	total petroleum hydrocarbons
USBR	U.S. Bureau of Reclamation
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
VOC	volatile organic compound
WAC	<i>Washington Administrative Code</i>
WIDS	Waste Information Data System

1.0 INTRODUCTION

1.1 PURPOSE AND DOCUMENT ORGANIZATION

This document is a compilation of readily available information on the nature and extent of contamination at waste sites in the 100-IU-1 and 100-IU-3 Operable Units (OUs) prior to cleanup, as well as records of sample collection, remediation, and revegetation for each site within the respective OUs. Summary information on trust natural resources is also provided, especially where it might relate to the waste sites and remediation. This material is intended as supporting documentation for a Preassessment Screen per Title 43 *Code of Federal Regulations* Part 11. Waste sites are described on a site-by-site basis, with each waste site identified with a site descriptive name and a Waste Information Data System (WIDS) identification number (DOE-RL 2002). It should be noted that the information in WIDS concerning these sites prior to 2003 was a very brief summary of the site description and cleanup actions. The original materials regarding the characterization and cleanup actions have been researched for this information document to better understand the work and resolve inconsistencies and the apparent lack of data for some sites. Based on this research, updates of the related waste site information will be provided to the WIDS database administrator for updating the WIDS.

This document includes all sites in both the 100-IU-1 and 100-IU-3 OUs, including sites that have been reclassified as "Deleted from the NPL" and those that have been reclassified as "Rejected" in WIDS per Procedure TPA-MP-14 (DOE-RL 1998). The sites that were "Rejected" in WIDS were considered to have only "housekeeping" work accomplished (i.e., removal of nonhazardous debris, filling in septic tanks or cisterns). The WIDS status of each site is provided after each site description.

Appendix A is a summary of the sampling results for each site; Appendix B is a chronology of the remedial activities and documents published for the two OUs.

1.2 HISTORY OF CERCLA ACTIONS AT 100-IU-1 AND 100-IU-3

In July 1989, the 100, 200, 300, and 1100 Areas of the Hanford Site were placed on the National Priorities List (NPL) under the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA), as amended by the *Superfund Amendments and Reauthorization Act of 1986* (Ecology et al. 1998). These four aggregate areas were identified as having potentially high levels of both chemical and radiological contaminants, requiring remedial response actions. The four aggregate areas were further subdivided into waste management units known as OUs, grouped by geographical area or common waste sources.

The 100 Area NPL site included 21 OUs consisting of waste sites associated with plutonium production reactors, former military installations, burial grounds, landfills, debris piles, and waste management practices. The two OUs addressed in this document are the 100-IU-1 ("Riverlands") and 100-IU-3 ("North Slope" or "Wahluke Slope") OUs.

The *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) states that, "Where immediate danger to the public or environment is possible, where the problem is straightforward, or where the area could be cleaned up using known technology, expedited response actions (ERAs) should be pursued to accelerate remediation of the Hanford Site" (Ecology et al. 1998). An ERA is the mechanism that allows for the elimination of potential hazards that can be an immediate threat to the public or environment.

Between 1992 and 1994, ERAs were performed for the remediation of waste sites in the 100-IU-1 and 100-IU-3 OUs. Most of the sites were either former military outposts (anti-aircraft guns or Nike missiles) or pre-Hanford homesteads. Most of the homesteads had been demolished when the government first came in, and the military sites were largely removed after the military presence was reduced. Known or suspected contamination at these OU waste sites included aldrin, dieldrin, 2,4-dichlorophenoxyacetic acid (2,4-D), petroleum-contaminated soil, asbestos-containing material, organic solvents, paint, grease, dichlorodiphenyl trichloroethane (DDT) and its decomposition products (i.e., metabolites), and petroleum products (EPA 1996). Surface and landfilled debris was excavated and removed; cisterns, septic tanks, and bunkers were backfilled with gravel or slurry; and wells were excavated and decommissioned. Many of the sites (those considered to have the potential for remaining hazardous constituents) were sampled for characterization, waste designation, or confirmation that the sites met cleanup criteria. Results of the ERAs led to the determination in the Proposed Plan and Record of Decision (ROD) that no further cleanup was required under CERCLA, and that the selected remedy was protective of public health, welfare, and the environment (DOE-RL 1995a, EPA 1996).

A Notice of Intent to Delete for partial deletion from the 100 Area aggregate site was published in the *Federal Register* on May 22, 1998 (63 FR 28317). Effective July 8, 1998, the 100-IU-1 and 100-IU-3 OU portions of the 100 Area NPL site were deleted (63 FR 36861).

1.3 SITE DESCRIPTION

The part of the Hanford Site north of the Columbia River, the 100-IU-3 OU, covers approximately 364 km² (140 mi²), and is separated from the rest of the Hanford Site by the Columbia River. The Riverlands area, the 100-IU-1 OU, is about 34 km² (13 mi²) and is bordered by Washington State Highway 24 to the south and east, the Columbia River to the north, and the Hanford Site boundary to the west. The land is semiarid, with a sparse covering of cold desert shrubs and drought-resistant grasses (EPA 1996).

The geologic structure of the 100 Areas consists of three levels of geologic formation: (1) a series of basalt flows at the deepest level, and showing as rock outcrops in some locations; (2) the Ringold Formation, which includes layers of silt, gravel, and sand; and (3) the Hanford formation, which is composed of gravel and sands deposited by catastrophic floods during glacial retreat. Groundwater flow in the unconfined aquifer is generally towards the Columbia River. Waste sites in these two OUs are not known or expected to have affected the groundwater. Several wetlands, caused by irrigation practices (wasteway drainage), are on the North Slope, but are not adjacent to any waste site in the OU. Non-Hanford Site land use near these OUs is mostly related to agriculture, wildlife conservation, and electric power generation.

The Columbia River bordering these OUs is undeveloped and used for recreation, wildlife conservation, and as a water source for some Hanford Site operations (EPA 1996).

1.3.1 Natural Resources Associated with the 100-IU-1 and 100-IU-3 Operable Units

Natural resources associated with the Hanford Site, including vegetation and animal species in the 100-IU-1 and 100-IU-3 OUs, have been characterized and described in sitewide natural resource survey and inventory documentation (e.g., Neitzel et al. 2002; Beck and Caplow 1995; Beck et al. 1995, 1998; Mitchell and Weiss 1992; Soll et al. 1999). That information is summarized in the following subsections.

1.3.1.1 Vegetation. The Nature Conservancy of Washington (Soll et al. 1999) conducted plant surveys on the Arid Lands Ecology Reserve, the Wahluke Slope, central Hanford Site, and riparian communities along the Columbia River shoreline from 1994 through 1997. These surveys identified 30 "potential" terrestrial plant communities on the Hanford Site. Designation as a potential community indicates the type of community that would exist in an area if it were free of disturbance. In addition to characterizing potential plant communities, the Conservancy found 112 populations/occurrences of 28 rare plant species on the Hanford Site (Soll et al. 1999). When these are combined with observations preceding the 1994-1999 inventory, the total becomes 127 populations of 30 rare species that have been documented on the Hanford Site.

Habitat descriptions and species associations pertaining to some specific waste sites in the 100-IU-3 OU are also listed in the *Environmental Restoration Contractor Revegetation Monitoring Report* (e.g., Johnson et al. 2000) and in *Assessment of Residual DDE at Four Remediated Hanford Waste Sites, Richland, Washington* (Linville et al. 1999).

Habitats associated with the 100-IU-1 and 100-IU-3 OU waste sites range from nonvegetated and low-quality/invasive species, to recovering shrub-steppe habitat. Typical species encountered on waste sites in the 100-IU-1 and 100-IU-3 OUs are weedy and early successional species such as cheatgrass (*Bromus tectorum*), ragweed (*Ambrosia acanthicarpa*), Russian thistle (*Salsola kali*), and tumbled mustard (*Sisymbrium altissimum*).

Some sites have been recolonized by big sagebrush (*Artemisia tridentata*) and Sandberg's bluegrass (*Poa sandbergii*) or have undergone active revegetation (Johnson et al. 2000). Revegetation efforts were carried out at some sites in the 100-IU-3 OUs where there was sufficient area and surrounding habitat quality for viable revegetation. Revegetated sites in the 100-IU-3 OU include the 2,4-D Burial Site (600-104), Bridge Overlook Site (600-95), MIL-PSN 72/82 (600-18), Wahluke Slope PSN 12/14 Military Construction Dump (600-74), and MIL-PSN 12/14 Site (600-17). Species mixes used in site revegetation were optimized for site conditions, such as soil type, drainage, and wind exposure. Annual monitoring was performed for each of the revegetated sites for a period of 5 years after revegetation, with results reported annually (e.g., see Johnson et al. 2000).

1.3.1.2 Wildlife. Wildlife species associated with the Hanford Site are described in the *Hanford Site National Environmental Policy Act (NEPA) Characterization* (Neitzel et al. 2002) and other relevant documentation published by The Nature Conservancy (Soll et al. 1999). Wildlife species

native to the Hanford Site include invertebrates, small mammals such as mice and rabbits, larger mammals such as mule deer and coyote, and several species of resident and migratory birds.

Species commonly encountered during environmental surveys on the Hanford North (Wahluke) Slope (Roy et al. 1998, Linville et al. 1999) included darkling beetles (*Eleodes* spp.), deer mice (*Peromyscus maniculatus*), pocket mice (*Perognathus parvus*), western meadowlark (*Sturnella neglecta*), and horned lark (*Eremophila alpestris*). Great Basin pocket mice are the most abundant small mammals on the Hanford Site (Neitzel et al. 2002).

1.4 MATERIALS POTENTIALLY RELEASED

1.4.1 100-IU-1

The contaminants of concern (COCs) for the 100-IU-1 sites listed in the ROD (EPA 1996) are aldrin and dieldrin for the Pesticide site, and diesel and heavy oil for the Rail Yard Maintenance Facility (EPA 1996). Appendix A, Table A-2 presents a summary of sampling results for each 100-IU-1 and 100-IU-3 OU site, with the maximum results for both pre-remediation and confirmatory samples (both COCs and other significant sampling results).

1.4.2 100-IU-3

The U.S. Department of Energy (DOE), Richland Operations Office (RL) (1994c) evaluated the contaminants likely to have been disposed at the military sites and presents a master list of contaminants of potential concern (from Table F-1 in DOE-RL [1994c]):

- Benzene
- Carbon tetrachloride
- Chromium (several forms)
- Petroleum hydrocarbons
- Lead
- Perchloroethylene
- Toluene
- 1,1,1-trichloroethane
- 1,1,2-trichloroethane
- Trichloroethylene.

The data from sampling conducted by Lucas (1992, 1993; data reported in DOE-RL 1994c, Appendix G) were compared with the action levels for soil in accordance with Method A of the *Model Toxics Control Act* (MTCA) (*Washington Administrative Code* [WAC] 173-340) for the 1993-1994 time period of cleanup) to accommodate proposed unrestricted land use for the North Slope. The comparison showed only petroleum hydrocarbons and lead exceeded action levels. For those analytes not listed under the residential soil action levels, the results were compared to the threshold levels for sitewide soil background (DOE-RL 1993a). No sample analytes differed significantly from background values. The semivolatile and volatile organic analytes identified were all less than 1 ppm. The identified herbicide and pesticide concentrations were also all less

than 1 ppm for the military sites, 2,4-D site, and one homestead site sampled by Lucas (1992, 1993; DOE-RL 1994c).

However, as noted by CDM (1994), during the excavation of the H-06L landfill more contamination was discovered than expected, including polycyclic aromatic hydrocarbons, pesticides, and lead. Consequently, anomalies identified by ground-penetrating radar (GPR) at the other landfills were also excavated and the soil sampled for volatile and semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), pesticides/polychlorinated biphenyls (PCBs), and metals.

Because arsenic, chromium, and DDT and its degradation products were still detected (but below cleanup levels) in the final confirmatory sample results for H-06L, they were listed as the final COCs in the ROD for that site (EPA 1996). The final COCs for the other listed sites were petroleum hydrocarbons and heavy oils, and 2,4-D at the 2,4-D disposal site (WIDS site 600-104).

1.4.3 Ordnance (Sitewide)

In addition to the site-specific contaminants, concern was raised about the potential for ordnance and explosive waste across the Hanford Site (DOE-RL 1994c). A Hanford Sitewide ordnance and explosives waste search (via historical records, interviews, a field evaluation, and trajectory calculations) was conducted by the U.S. Army Corps of Engineers at the same general time as the ERAs. The *Ordnance and Explosive Waste Records Search Report* (DOE-RL 1994d) concluded that there is little risk from ordnance at the Hanford Site and that no further action was required (DOE-RL 1994d, 1994c).

1.5 ADDITIONAL STUDIES AND ANALYSIS

Per the *Proposed Plan for the 100-IU-1, 100-IU-3, 100-IU-4, and 100-IU-5 Operable Units* (DOE-RL 1995a) and work completion report (DOE-RL 1994a, CDM 1994), during the cleanup actions at these OUs soil was excavated until the Washington State MTCA cleanup criteria were met as determined by field screening and laboratory sampling.

“...organic and inorganic analytes were detected at concentrations exceeding MTCA cleanup levels in several samples collected at the North Slope sites. *Without exception, every sample in which an analyte exceeded MTCA cleanup levels represented material which was eventually transported and disposed offsite* (italics added). The MTCA cleanup levels most commonly exceeded in North Slope site samples were TPH, DDT, DDE, and DDD. Soils contaminated with these organic compounds also comprise nearly all of the waste materials which required offsite disposal. Other analytes which exceeded their respective MTCA cleanup levels were the pesticides chlordane and dieldrin (in samples containing higher concentrations of DDD, DDE, and DDT), lead (in a paint waste sample and a sample of a tar-like waste), and several PAHs (in the sample of tar-like waste).”¹ (CDM 1994)

¹ Polycyclic aromatic hydrocarbons (PAHs) in asphalt matrix are exempt from CERCLA.

A proposed plan under the CERCLA process is a summary of the information relied upon to recommend the preferred alternative, in this case, no further action. Proposed plans are published for public review and comment. The proposed plan for the operable units (DOE-RL 1995a) notes that "According to risk calculations based on the MTCA, the residential cleanup level provides an acceptable level of risk to human health and the environment. Final cleanup sampling results were below the cleanup level."

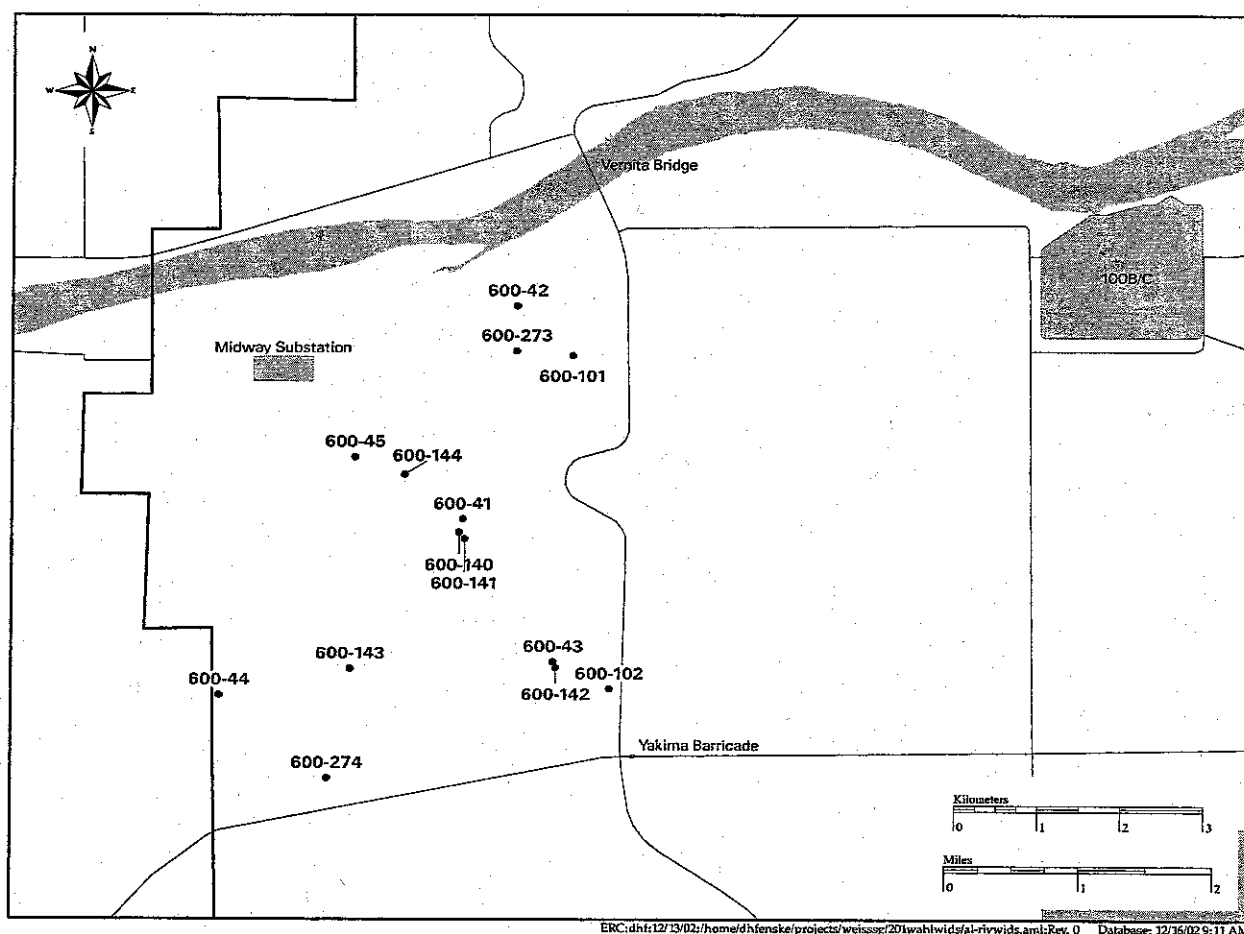
After the North Slope was deleted from the NPL, two studies evaluated the possible risk to wildlife (insects, small and large birds, and small mammals) from sites on the North Slope. Roy et al. (1998) examined 13 North Slope sites and calculated that sites H-06-L, PSN-90, and PSN-01 potentially posed a high risk to migratory birds from dichlorodiphenyl dichloroethylene (DDE) exposure. Eight additional sites were reported to pose moderate predicted risk. Site H-06-LE (east) also had a calculated "elevated predicted risk" to kestrels. Large birds of prey on the North Slope did not accumulate elevated concentrations of organochlorine pesticides, suggesting that they are not presently being exposed to elevated concentrations of the compounds, and that contamination is not widespread. Only one class of compound (DDT and its metabolites) was evaluated for the study.

A follow-up study (Linville et al. 1999) assessed the levels of DDT and its metabolites in insects and birds at four North Slope sites that Roy (1998) identified as having a potentially high risk: PSN-90, PSN-01, and H-06LE. The levels detected were comparable to Roy et al. (1998). Linville et al. (1999) also evaluated other published studies on the effects of DDT and its metabolites on wildlife to determine their ecological significance to Hanford. Linville et al. (1999) concluded that, based on the high levels of DDE required to affect passerine birds, and because of the low levels of DDE detected at Hanford and the size of the areas contaminated "...it is not likely the levels are high enough to cause lethal or sub-lethal effects to individuals and it is impossible to have population-level effects." While DDT is the pesticide that was applied in the past, it has a shorter half-life in soil than its decomposition product, DDE. Consequently, most of the related studies have reported the effects of DDE on biota instead of DDT (e.g., as reported in ATSDR 2002). In addition, the sampling completed at Hanford (Linville et al. 1999) confirmed that DDE was present at many locations including the control site, but DDT was found only in one sample. Of the two, DDE appears to be more of a risk to the eggshell thinning in birds, "the most important reproductive effect observed in wildlife..." (ATSDR 2002).

2.0 100-IU-1 OPERABLE UNIT WIDS SITE INFORMATION

The 100-IU-1 OU contains 14 waste sites, most from Hanford Site operations occurring between 1943 and 1954 (Figure 1). The 100-IU-1 OU supported Hanford Site construction, operation, and military activities; the most significant site was a railcar maintenance facility, where locomotives and rolling stock were decontaminated and repaired. The 100-IU-1 OU contained four waste sites that have been deleted from the NPL: a pesticide container site (600-44), the

Figure 1. WIDS Identifier Codes Showing the Approximate Location of the Sites in the 100-IU-1 Operable Unit (Riverlands).



Riverland Rail Yard Maintenance Facility (600-101), a munitions cache (600-102), and a 2,4-D pesticide can disposal area (600-274). Ten other sites at the OU include military installations, homestead sites, and debris piles, for a total of 14 CERCLA and “housekeeping” cleanup sites.

Suspected or known contaminants in the 100-IU-1 waste sites included aldrin, dieldrin, 2,4-D, and petroleum-contaminated soil (EPA 1996). Noncontaminated debris was also present at the waste sites. In 1993, the Riverland ERA (DOE-RL 1995b) was performed to remove all known or suspected contaminant sources and other hazardous or nuisance debris.

Under the Riverland ERA, 260 m³ (340 yd³) of concrete were removed and recycled; 329 m³ (430 yd³) of petroleum-contaminated soil were removed for bioremediation; and eleven 2,4-D containers were sampled, designated as nonhazardous, and disposed with the associated soil in one 208-L (55-gal) drum. Twenty-seven 208-L (55-gal) drums containing soil with residual aldrin and dieldrin waste were designated nondangerous waste and sent to the Hanford Central Landfill (DOE-RL 1995a).

The following subsections detail waste types at each of the 100-IU-1 OU waste sites, and any sampling, remediation, or revegetation efforts made at each site.

2.1 H 70, PSN 70, ANTI-AIRCRAFT ARTILLERY SITE (600-41)

The H 70 Anti-Aircraft Artillery (AAA) Site (WIDS site code 600-41) is an abandoned military installation originally established in 1951. The H 70 AAA Site is located 4.2 km (2.6 mi) southwest of the Vernita Bridge rest area on the west side of Highway 24 inside gate 122. The site is approximately 305 by 305 m (1,000 by 1,000 ft), covering an area of approximately 9.3 ha (23 acres). The site was originally an anti-aircraft battery that had several facilities, including a classroom, latrines, craft shop, barracks, supply room, day room, and an administration room. A septic system and drain field also served the latrine facilities. Overhead wiring provided electricity and water was pumped from the McGee Well (well 699-53-103). As of June 30, 1960, only the septic system, roads, and sidewalks remained in the Camp Hanford inventory (Anonymous 1993). Anonymous (1993) does not report any underground fuel storage tanks (USTs) for the site.

After the facilities were torn down, no hazardous wastes were visible at the site. There were scattered amounts of glass, metal, concrete, and transite, as well as a burn pit/dump also with a few scattered pieces of glass and transite. GPR and electromagnetic induction surveys in three locations at this site did not find any anomalies to warrant further investigation (DOE-RL 1993b). There is no record of the septic tank having been removed or evidence of it still being at the site.

The site was remediated by the DOE under landlord actions that fell outside of the CERCLA regulations (DOE-RL 1995a). A landlord action is when the physical and nonhazardous constituents from the site are removed as part of a best management practice. This includes trash and debris removal, all of which is disposed of in the proper facilities.

A visit in April 1999 (DOE-RL 2002) revealed that only a few covered foundations, parts of the paved road, some man-made mounds, and various cleared areas remained of the original facilities. The rest was overgrown with large sagebrush about 0.9 m (3 ft) tall, cheatgrass, and a few trees that completely covered the rest of the site, making it difficult to discern what was left on the site or even the edges of the site.

This site was cleaned up under landlord actions; therefore, it is classified as "Rejected" in WIDS.

WIDS Status: Rejected.

2.2 H 71 ANTI-AIRCRAFT ARTILLERY SITE (600-42)

The H 71 AAA Site (WIDS site code 600-42) is an abandoned military installation. The site was located approximately 1.6 km (1 mi) southwest of the Vernita Bridge rest area on Highway 24. The site measured approximately 305 by 305 m (1,000 by 1,000 ft), for a total area of

approximately 9.3 ha (23 acres). The original facilities on site included barracks, latrines connected to a septic system, supply rooms, a 28-m (93-ft) well (completed in 1952) and pumphouse, and an overhead electrical system similar to those found on the H 70 AAA Site. No UST is listed in Anonymous (1993). As of June 30, 1960, only the septic system, roads, sidewalks, and parking area remained in the Camp Hanford inventory.

All aboveground structures on the waste site have been removed. During a global positioning survey conducted in April 1999, the remains of a small tile field were found. The septic system that was associated with the tile field appeared to have been either removed or has collapsed. Remnants of concrete and rock walkways were found at the site as well as wood debris, glass, and concrete chunks. A metal lid was found amid the debris that was stamped "120 MM GUN" and "CONT M79A." The remains of an underground bunker were also discovered during this 1999 survey. The bunker measured 1.2 m (4 ft) wide by 2.4 m (8 ft) long with an unknown depth, and was constructed of wooden timbers (DOE-RL 2002).

No visible hazardous materials were discovered.

DOE cleaned up this site through landlord actions (DOE-RL 1995a), and the site has been rejected as a potential waste site in WIDS.

WIDS Status: Rejected.

2.3 MCGEE FISH FARM (600-43)

The McGee Fish Farm (600-43) was an abandoned commercial fish farm located northwest of the Yakima Barricade, west of Highway 24 and about 45 m (148 ft) north of well 699-53-103.

The site was used as a commercial tropical fish farm in the early 1970s. The fish farm was located at McGee Ranch due to the unusually warm water from an onsite well. While in operation, the ponds were excavated, lined with black plastic, and fed water from polyvinyl chloride piping. The farm operated for about 2 years and was then abandoned. Eleven 8-m³ (10-yd³) dump trucks of debris were removed to the central landfill (Heiden 1992, DOE-RL 1995a). Residual debris identified during a site visit in 1999 included broken plastic pipe parts, plastic sheeting, wood, metal, glass, and various automobile parts (DOE-RL 2002).

No further action was required for this site following the ERA and subsequent ROD (EPA 1996). DOE cleaned up this site through landlord actions, and the site has been rejected as a potential waste site in WIDS.

WIDS Status: Rejected.

2.4 HERBICIDE/PESTICIDE EMPTY CONTAINER PILE, ENYERT WELL, EMPTY PESTICIDE CONTAINER DUMP (600-44)

The Herbicide/Pesticide Empty Container Pile (WIDS site code 600-44) was discovered during a visual inspection performed as part of the Riverland ERA (DOE-RL 1995b). During the inspection several empty herbicide/pesticide cans were found within an area roughly 4.6 m (15 ft) by 4.6 m (15 ft). The site is located on an old, abandoned homestead located approximately 150 m (500 ft) east of the commercial vineyard on the west side of Cold Creek Road. The cans consisted of 4- and 19-L (1- and 5-gal) containers that contained aldrin and dieldrin (DOE-RL 1995b). These two chemicals were used as a pesticide from the 1950s to the early 1960s and were classified as COCs. The amount of rust and general conditions of the cans suggested that they were dumped after Hanford Site operations began (DOE-RL 1995a).

DOE-RL (1993b) reports the results of initial samples from the pesticide containers. The maximum result for aldrin was 27,000 ppb, and 38,000 ppb for dieldrin. During remediation, the 2.1-m by 5.5-m (7- by 18-ft) excavation was tested with field screening instruments until the instruments showed less than 2 ppm aldrin, at a maximum depth of 0.76 m (30 in) (Heiden 1992).

The 15 crushed pesticide containers (in two 208-L [55-gal] drums) and twenty-five 208-L (55-gal) drums of contaminated soil were disposed at the Hanford Central Landfill (Heiden 1992, DOE-RL 1995a, EPA 1996). Confirmatory samples were tested for a variety of pesticides, including aldrin and dieldrin (EPA 1996). Confirmatory sample numbers are B08NP7, B08NQ6, B08NQ7, B08NQ8, and B08NQ9 (background) (Heiden 1992); the results can be found in the Hanford Environmental Information System (HEIS) database. A summary of the results is in Appendix A. Sampling results for laboratory analyses indicated maximum values of 0.45 ppb (with an "estimated" analytical laboratory qualifier) aldrin and 3.6 ppb dieldrin, which are below the Residential Standards set by the Washington State MTCA (DOE-RL 1995a, 1995b). The background sample results showed that aldrin was undetected, dieldrin was 1.2 ppb (also with an "estimated" analytical laboratory qualifier) and 4,4'-DDE was 6.7 ppb. (Note that Table 2 in the ROD [EPA 1996] provides the results for the Pesticide Container site [600-44] under the heading for the 2,4-D site.)

Six old batteries, scattered north and east of the pesticide excavation, were picked up with shovels, and the underlying soil was sampled with field X-ray fluorescence for metals. Only zinc was detected (Heiden 1992).

No further action was required for this site following the ERA (DOE-RL 1995b) and subsequent ROD (EPA 1996). The site was deleted from the NPL on July 8, 1998 (DOE-RL 2002).

WIDS Status: Deleted from the NPL.

2.5 TRANSITE AND METAL DEBRIS PILE (600-45)

The Transite and Metal Debris Pile Site (WIDS site code 600-45) contained debris associated with the military activities and facilities from the H 70 AAA Site. The site is not marked or posted. The original site is an irregular shape covering approximately 500 m² (5,350 ft²) ending at a cliff. The site is located west of Highway 24 on Umtanum Ridge about 1.6 km (1 mi) southeast of the Midway Substation and 1.6 km (1 mi) west of AAA site H 70.

A field investigation (Heiden 1992) showed that the debris was related to actions on the H-70 military waste site. Broken transite shingles and other trash such as pallet binding straps, exhaust stacks made from drums, and miscellaneous military food cans were scattered around the site. In 1993, 23 bags of transite were removed, along with two 8-m³ (10-yd³) truckloads of miscellaneous debris (Heiden 1992). This cleanup was part of a routine maintenance done by DOE, and no hazardous material was found on the site (DOE-RL 1995a). No further action was required for this site following the ERA (DOE-RL 1993b) and subsequent ROD (EPA 1996). DOE cleaned up this site through landlord actions, and the site has been rejected as a potential waste site in WIDS.

WIDS Status: Rejected.

2.6 RIVERLAND RAILROAD CAR WASH PIT (600-101)

The Riverland Railroad Car Wash Pit (WIDS site code 600-101) was associated with the cleaning and decontamination of railroad cars at the Riverland Railroad Maintenance Facility (Building 6718). The wash pits where the cars were cleaned were each about 1 by 2 m (3 by 6 ft) and drained through pipes to an adjacent open ditch (DOE-RL 1995b). The site is located about 0.8 km (0.5 mi) west of State Highway 240 and 2 km (1.3 mi) southwest of Vernita Bridge.

The Riverland Rail Yard was built in 1943 to support Hanford Site construction and operation activities (DOE-RL 1995b). The yard received all rail freight for the Hanford Area during the early years of the Hanford Manhattan Engineering District Project (DOE-RL 1995b). The Riverland Railroad Facility steam-cleaned and decontaminated the cars of grease and radioactive contamination. Grease and oil from the undercarriage, wheels, axles, and brakes was removed. The engine compartments, radiators, and fans were also cleaned and decontaminated in diesel locomotives (DOE-RL 1995b). The radioactive contaminants commonly removed from this equipment were fission product particles such as ruthenium, zirconium, niobium, and iodine (Smith and Stanley 1993). The contaminants were removed by decontamination personnel via acetone-soaked absorbent pads. The contaminated equipment was then bagged and sent to the 200 West Area for disposal (Smith and Stanley 1993).

In 1963 the facility was decontaminated and sold to the public (Smith and Stanley 1993). The foundations were covered with about 0.6 m (2 ft) of soil, and radiological surveys were performed in 1977, 1978, and 1993. None of these surveys found any levels of radioactivity above the normal, natural background radioactivity levels (8 to 14 μ R/hr) (Smith and Stanley 1993, DOE-RL 1995b). Pre-remediation sampling (eight samples, numbers B01928 through

B01935) showed a maximum of 1,800 ppm diesel and 2,210 ppm heavier-than-diesel TPH. The maximum radionuclide detected was 19.6 pCi/g cesium-137 from a drain-pipe soil sample (DOE-RL 1993b).

In 1992 and 1993 the site was characterized and cleaned up under the Riverland ERA (DOE-RL 1995b; Heiden 1992, 1993, 1994). A GPR survey over the area indicated on the site plan for a 45,424-L (12,000-gal) diesel tank showed it to have already been removed (DOE-RL 1993b). About 260 m³ (340 yd³) of concrete and fill material was removed from the wash pits and recycled through a concrete recycling plant in the 100-B/C Area, and 330 m³ (430 yd³) of diesel-contaminated soil were sent off the site for bioremediation (DOE-RL 1995a). Radiological surveys performed on site demonstrated no noticeable levels of radiation above the background levels of the area. Sixty samples, including splits, duplicates, blanks, background, and confirmatory samples, were taken from the site. See Heiden (1992, 1993, 1994) for the sample numbers; the results can be found in the HEIS or the Administrative Record.

The excavations were cleaned up, and five confirmatory samples, split with Washington Departments of Ecology and Health on August 26, 1994, showed no diesel fuel or motor oil above the laboratory detection limit (all results showed as "undetected"). See Appendix A for a summary of the results. All radionuclides in the excavation (drain trench and under cleaning facility) were at or below 1 pCi/g, except for potassium-40, a naturally occurring radionuclide, not a fission product. The complete results for samples B0CWR8, B0CWR9, B0CWS0, B0CWS1, and B0CWS2 are in the HEIS database. The site also meets the cleanup level of 200 ppm for total petroleum hydrocarbons in soil based on residential cleanup levels in MTCA. No diesel fuel or heavy motor oil contamination above the 2 ppm laboratory detection limit was found during final cleanup sampling (DOE-RL 1995a, 1995b; EPA 1996). The site was declared nonradioactive, and the pits were backfilled with clean material from onsite (DOE-RL 1995a).

No further action was required for this site following the ERA (DOE-RL 1995b) and subsequent ROD (EPA 1996). On July 8, 1998 the site was deleted from the NPL (DOE-RL 2002).

WIDS Status: Deleted from the NPL.

2.7 600 AREA ARMY MUNITIONS BURIAL SITE (600-102)

The 600 Army Munitions Burial Site (WIDS site code 600-10) was a shallow excavation area that contained a wooden crate used to bury emergency supplies of explosives and munitions during military exercises in the 1970s (Smith and Stanley 1993). The site is located northwest of the 200 West Area and about 100 m (330 ft) west of Gate 12 near the McGee Ranch.

The excavated area was approximately 0.61 m (2 ft) wide by 0.91 m (3 ft) long. The crate was buried between 1971 and 1976. The crate contained 6 gun blast simulators, Model 110, dated October 1953; 78 boxes (5 to a box) of fuse igniters, Model M60, Lot KYC-1, dated May 1960; one trip flare, Model M49; one can containing 50 nonelectrical blasting caps, marked "ARMY;" 43 electrical blasting caps; ~150 m (500 ft) of time fuse; ~60 m (200 ft) of detonating cord; and remnants of 1 grenade or artillery simulator. On May 22, 1986 all items were removed and

transported to the Yakima Firing Range for destruction (DOE-RL 1993b, Smith and Stanley 1993).

A nonintrusive surface soil sample was taken (Number B01937, with split B01938) and analyzed for nitrates and nitrites (Heiden 1992). The results showed 32.9 ppm nitrate/nitrite (DOE-RL 1993b, 1995a; Weston 1992). Note that a confusing sentence on page 5 of the Smith and Stanley (1993) Action Memorandum for the Riverland site reports hydrocarbon contamination for three sites:

“The soil analysis at the munitions cache and homestead pesticide/herbicide site indicated elevated levels of total petroleum hydrocarbons (TPH) diesel fuel (220 to 1,800 ppm), TPH heavier than diesel (motor oil) (2,210 ppm) at the rail yard site, and pesticide...”

The actual results in an earlier document (DOE/RL 1993b, pages B-3 and B-4) shows that both the diesel and TPH heavier than diesel results in Smith and Stanley (1993) are for samples taken at the rail yard maintenance facility, and all the TPH results for the munitions cache site are nonreportable.

No further action was required for this site following the Riverland ERA (DOE-RL 1995b) and subsequent ROD (EPA 1996). On July 8, 1998 the site was deleted from the NPL list (DOE-RL 2002).

WIDS Status: Deleted from the NPL.

2.8 GUNNYSACKS SOUTH OF H-70 ANTI-AIRCRAFT SITE (600-140)

This site (WIDS site code 600-140) was composed of partially buried, abandoned gunnysacks. The site is located north of Highway SR24, west of Highway SR240. It is about 1.9 km (1.2 mi) west of gate 122 from Highway SR240 and approximately 170 m (550 ft) south-southwest of the H 70 AAA Site.

The sacks were found on January 11, 1995, during a Riverland field investigation (DOE-RL 1995b). During the summer of 1996 a range fire may have burned some of the sacks, which were filled with soil used to construct ammunition storage structures. The sacks were made of natural fibers, and no hazardous materials were found at the site. This site has been rejected in WIDS (DOE-RL 2002).

WIDS Status: Rejected.

2.9 BARRELS SOUTH OF H-70 ANTI-AIRCRAFT SITE (600-141)

This site contains two empty containers. The site is located north of Highway SR24 and west of Highway SR240. The site is 1.9 km (1.2 mi) west of gate 122 from Highway SR240 and approximately 240 m (800 ft) south-southwest of the H 70 AAA Site.

One of the empty containers (still present in May 2003) is a 113-L (30-gal) drum painted army green and yellow. It is only partially buried and had no labels or markings visible. The other partially buried container was an empty garbage can. The garbage can had no labels, markings, or identifying parts to identify what either it or the drum were used for. The site has been rejected as a potential waste site in WIDS (DOE-RL 2002).

WIDS Status: Rejected.

2.10 CAR BODY AT MCGEE RANCH FISH FARM (600-142)

The site is an abandoned automobile. It is located approximately 1.1 km (0.7 mi) west from gate 121 from Highway SR240. The car is on the McGee Ranch Fish Farm and about 140 m (450 ft) north of the McGee Well.

The car is resting upside down on its roof. It has been partially crushed and still has its engine, transmission, differential, and radiator. The battery is gone, the radiator is empty, and there is no visible leakage of automobile fluids. There were no other hazards identified on site. This site was rejected as a waste site in WIDS (DOE-RL 2002).

WIDS Status: Rejected.

2.11 CAR BODY AT FORD WELL (600-143)

The site consists of a single automobile body, with engine, transmission, radiator, and battery removed. The site is located approximately 55 m (180 ft) north of the Ford Artesian Well, north of Highway SR24 and west of Highway SR240.

There were several bullet holes observed in the car body. There are no other hazards at the site. This site has been rejected as a waste site in WIDS (DOE-RL 2002).

WIDS Status: Rejected.

2.12 CAR BODY NEAR TOP OF UMPTANUM RIDGE (600-144)

The site consists of a single car body, with engine, transmission, radiator, and battery removed. It is located north of Highway SR24 and west of Highway SR240. It is about 2.9 km (1.8 mi) west-northwest of gate 122 off of Highway SR240 and about 0.2 km (0.12 mi) south of the crest

of Umptanum Ridge on the east flank just west of the road that leads to the ridge crest. There are no other hazards at the site. This site was rejected as a waste site in WIDS (DOE-RL 2002).

WIDS Status: Rejected.

2.13 PILE OF RED MATERIAL AT RIVERLAND (600-273)

This waste site (WIDS site code 600-237) is composed of a pile of red material about 1.37 m (4.5 ft) high, 9.14 m (30 ft) long, and 4.57 m (15 ft) wide. The total volume for this pile was calculated to be about 113 m³ (3,991 ft³). The site is located at the far western end of the Railroad Maintenance Facility, about 1.6 km (1 mi) from Highway 24 and 150 m (500 ft) north of the road to the Midway Substation.

The pile was noticed by the U.S. Fish and Wildlife Service (USFWS) during a pre-acquisition survey done in preparation for the turnover of the Hanford Reach National Monument from DOE to the USFWS (Hughes 2001). The survey reported a pile of reddish material that was similar to crushed brick, but the material was highly water-soluble. It turned covering snow layers red and was also found in smaller scattered piles throughout the nearby area.

Another visit was made in 2001 (DOE-RL 2002). A magnet was able to pick up the fine particles. The pile is believed to be aluminum smelter slag that was dumped by a hopper car undergoing maintenance at a nearby facility. This slag material was mixed with concrete for use in construction and shielding in the reactors because of the high iron content (DOE-RL 2002). Similar material found adjacent to the railroad in another location (e.g., WIDS site 600-69) was analyzed. An x-ray fluorescence spectra analysis of this red material detected no anomalous heavy metals. An extremely large iron peak indicated that the sample was at least several percent iron. The red color was consistent with iron oxide, and site 600-69 was rejected in WIDS (DOE-RL 2002).

More recent analyses (March 2003) of a pile of similar material in the 100-B/C Area showed iron at 48%, chromium at 1.5%, and aluminum at 0.2%, typical of aluminum smelter slag. (Unpublished data as of the publication date of this document.)

Slag material is not conducive to plant growth because it is usually devoid of organic matter, plant available nitrogen and phosphorus, and has a poor water-holding capacity. However, plants that can get established and find native soil to root in under a thinner layer of the material will survive. The density of plant growth depends on the depth of the slag and the amount of native soil intermixed (e.g., no vegetation on top of the pile, but plant growth occurs at the bottom).

Site 600-273 was entered into WIDS in 2001, but no decision as to its disposition has been made, pending further evaluation.

WIDS Status: Discovery Site.

2.14 2,4-D CAN SITE AT MCGEE RANCH, RIVERLAND (600-274)

In July 1994, a Pacific Northwest Laboratory archaeological survey identified eleven 19-L (5-gal) cans buried among old-growth sagebrush and cheatgrass at the 2,4-D Can Site (WIDS site code 600-274) (DOE-RL 1995b). This site is located about 300 m (1,000 ft) north of Highway 24 and 3.2 km (2 mi) west of the Yakima Barricade. About 100 m (330 ft) directly north of this site was a second area, which was discovered in 2001. This site had three additional 19-L (5-gal) cans in the sagebrush (DOE-RL 2002).

At the first site, nine of the cans were buried upright and adjacent to each other with only the tops showing at the ground surface. The other two cans were lying on top of the soil nearby. The three cans at the second site were also lying in the open, on top of the soil (not buried). The origins of the cans are unknown, but testing and labeling on one of the cans from the first site confirm they contained 2,4-D, a herbicide. Only one of the buried cans still had liquid, the rest were heavily rusted and contained varying amounts of soil that had fallen in over the years (DOE-RL 1995b).

Four samples were taken from the cans that contained soil and liquid: B0D0F1, B0D0F2, B0D0H6, and duplicate B0D0H7 (Heiden 1994). As the cans were excavated, the soil below the cans was sampled, usually at the surface, at 0.3-m, 0.6-m, and 0.9-m (1-ft, 2-ft, and 3-ft) depths in four locations, plus a background location, to test for contamination. The cans were removed from the area, and the remaining soil within the cans was placed into one large 208-L (55-gal) drum. The excavated area was left open until the analytical results came back, and then the holes were backfilled (DOE-RL 1995b). The sample results showed a maximum hit of 38,000 ppm (B0D0F1) in material collected from inside the cans. The maximum confirmatory sample result (16 samples, plus 2 additional background samples) was 27 ppm 2,4-D; the other 2,4-D results were all below 3 ppm (Heiden 1994, DOE-RL 2002). The maximum background result was 0.25 ppm 2,4-D. The cleanup standard for the 2,4-D site (site 600-104) on the North Slope was 800 ppm (Ecology and DOE-RL 1997); no cleanup standards were listed in the ROD (EPA 1996) for site 600-274.

Note that Table 2 in the ROD (EPA 1996) provides the sampling results for the Pesticide Container site (600-44) under the heading for the 2,4-D site. Appendix A, Table A-1 presents a summary of the sampling results; complete confirmatory sample results are stored in the HEIS database.

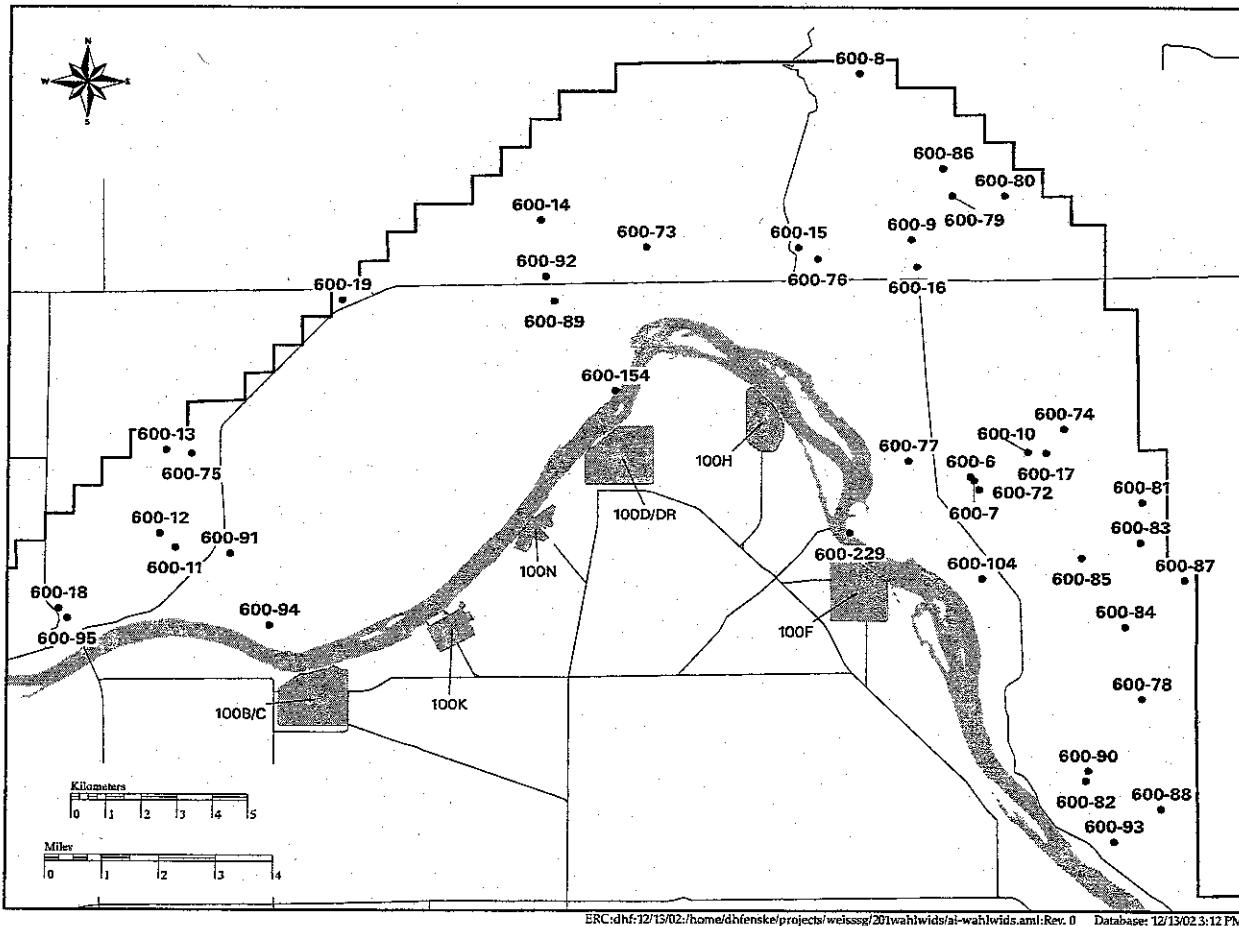
Nearby vegetation displayed no signs of distress, and the soil surrounding the cans was not discolored. At the second part of the site, three other 19-L (5-gal) cans were found in 2001 and removed and disposed in 2002. The cans at the second site were unmarked, empty, and showed no signs of having leaked any material. This waste site was deleted from the NPL on July 8, 1998 (DOE-RL 2002).

WIDS Status: Deleted from the NPL.

3.0 100-IU-3 OPERABLE UNIT WIDS SITE INFORMATION

The 100-IU-3 OU consists of 41 waste sites, including Nike missile launch sites, anti-aircraft battery sites, former military installation areas, construction dumps, debris sites, cisterns, and pre-Hanford homestead sites (Figure 2). Waste sites in this OU are located on the Hanford North Slope (Wahluke Slope). The area was acquired for use as a military buffer zone against potential hostile attacks on plutonium production reactors in the 100 Areas (EPA 1996) and as a safety buffer zone to limit potential public exposure to radiological and hazardous chemicals from routine operations and accidents (DOE 1999).

Figure 2. WIDS Identifier Codes Showing the Approximate Location of the Sites at the 100-IU-3 Operable Unit (North Slope).



In 1989 and 1990, a visual investigation of the North Slope was performed to inventory any potential health, safety, and environmental concerns remaining from the military presence or previous homesteading (Roos 1990). As a result, 39 sites were identified and recorded for further investigations or actions (DOE-RL 1994b). Known or suspected sources of contamination at the 100-IU-3 OU waste sites included asbestos-containing material, organic solvents, petroleum products, paint, grease, DDT and its breakdown products, and petroleum-contaminated soil. Sites in the 100-IU-3 OU were addressed in the *North Slope Expedited Response Action Cleanup Plan* (North Slope ERA) (DOE-RL 1994c), which evaluated remedial action alternatives (including non-CERCLA landlord cleanup actions) for 39 sites. Between 1992 and 1994, the North Slope ERA was performed to remediate sites within this OU. The results of the ERA were reported in the *Draft Interim Closeout Report North Slope (Wahluke Slope) Expedited Response Action, Hanford, Washington* (DOE-RL 1994b). Three of the sites in 100-IU-3 (600-8, 600-9, and 600-104) have been deleted from the NPL through the Partial Deletion process (63 FR 30861). The rest of the sites were cleaned up under landlord actions (not subject to CERCLA regulations) and have been reclassified as "Rejected" in WIDS (as of January 30, 2003).

3.1 NORTH SLOPE LANDFILL INVESTIGATIONS

Three landfills at missile sites (H-83, PSN-04, and H-06) were chosen to serve as analogous sites for geophysical surveys and initial characterization sampling at all the military landfills remaining. A hollow-stem auger rig was used to obtain 32 samples from 45 locations where anomalies were indicated based on the geophysical surveys. These samples were sent for offsite analysis for volatile and semivolatile analysis, pesticides/herbicides, PCBs, metals (including mercury), anions, TPH, and total radionuclide activity. Field screening (90 samples, 2 per auger hole) was used to determine the scope of sampling at each location. No areas of contamination above MTCA, Method A, regulatory limits were detected (Lucas 1992, Ecology and EPA 1994, DOE-RL 1994c).

However, as reported in the interim closeout report (DOE-RL 1994b), full characterization of the H-06L landfill began in April 1994 as a confirmation of the sampling results per the Action Memorandum (Ecology and EPA 1994). Each location identified by the geophysical investigation (WHC 1992) as having an anomaly was excavated with a bulldozer or backhoe. Suspect waste was sampled for characterization by an offsite laboratory. Approximately 459 m³ (600 yd³) of DDT-contaminated soil was discovered and disposed of at the Chemical Waste Management Hazardous Waste Landfill in Arlington, Oregon. More than 153 m³ (200 yd³) of petroleum-contaminated soil were found and disposed of in Pasco. Six 208-L (55-gal) drums of soil contaminated with metals from paint, tar-like waste, and soil from beneath several pesticide cans were designated and sent to the Hanford 616 waste facility. No ordnance or explosive waste was found.

Based on these discoveries, the U.S. Environmental Protection Agency (EPA) and Washington State Department of Ecology (Ecology) asked that the remaining North Slope disposal areas also be characterized and remediated as needed (DOE-RL 1994b). Each of 10 potential landfill sites received a geophysical investigation to identify and excavate anomalies (Smith and Rhoades 1994).

The characterization and excavation results for each landfill site are reported in CDM (1994) and below for each site. The North Slope Closeout Report (DOE-RL 1994b) summarized the work completed at the landfills as follows: A 1.5- to 3-m (5- to 10-ft) trench was excavated through the length of each identified anomaly. A total of 13,686 m³ (17,900 yd³) of suspect waste materials were excavated and evaluated from 13 former disposal locations. Aside from a few dried paint chips, no other regulated materials were found. Approximately 1.5 m³ (2 yd³) of petroleum-contaminated soil was discovered at the H-83L disposal site. About 4.6 m³ (6 yd³) of petroleum-contaminated soil not associated with any disposal area were discovered at sites PSN-01 and PSN-80 near the well structures. Approximately 27 m³ (35 yd³) of soil from the vehicle rack at PSN-90 was contaminated with dinitrotoluene in addition to petroleum hydrocarbons. These wastes were disposed of at the Arlington landfill (DOE-RL 1994b).

3.2 UNDERGROUND STORAGE TANKS AT MILITARY SITES

While the Anonymous (1993) summary report of the facilities at each of the military sites frequently lists USTs for fuel, geophysical surveys could not detect any USTs (Ecology and EPA 1994, WHC 1992, Smith and Rhoades 1994). The Anonymous (1993) report also states that the "listed" facilities at sites were either destroyed or sold to Washington State University. Whether the facilities sold or destroyed include the USTs or just the aboveground buildings is not specified. In addition, the Action Memorandum (Ecology and EPA 1994) states that "An interview with a former soldier stationed at Nike position H-83-C indicated that the tanks were not underground but rather of the skid-mounted variety." However, the Anonymous (1993) report lists for site H-83-C "one 1,500-gallon diesel UST." The field crews removing debris reported a few locations where stand pipes were seen; these pipes may have been related to septic tanks, fuel tanks, or for other purposes.

The Anonymous (1993) report also states that the only fairly complete site plan of an AAA facility was for H-03H, in the central region of the Hanford Site. On this site plan, only one 5,678-L (1,500-gal) UST was indicated, but several aboveground tanks with capacities up to 5,678 L (1,500 gal) of fuel oil were also shown. In addition, nearly every occupied building had a 208-L (55-gal) aboveground tank for heating oil. While the cleanup records for the north slope (Shannon & Wilson 1994a, 1994b) frequently report that septic tanks were found and backfilled, no mention is made of USTs for fuel. This may be because they had already been removed during earlier site decommissioning activities. In summary, while the presence of remaining USTs at some sites cannot be ruled out, evidence suggests that any remaining USTs would not be common.

3.3 BACKGROUND SOIL SAMPLING

Per CDM (1994), 13 background soil samples were collected from North Slope sites to form a base of comparison with samples from the landfills. Background samples were analyzed for the same compounds as the landfill samples, with the exception of petroleum hydrocarbons. The background samples were collected within a few hundred feet of the sites with which they were

associated, and from depths of about 0.6 m (2 ft) below ground surface to reduce the potential for surface contamination. The samples collected were as follows:

- Three samples from H-06L West
- One sample from each of the following sites: H-06L East, H-83L, Bridge Overlook 2, PSN-12/14, PSN-90, Igloo, PSN-04, and H-12L
- Duplicate samples from H-83C.

Three EPA priority metals, arsenic, barium, and chromium, were detected in all 13 samples. Arsenic ranged from 1.02 to 6.71 ppm with an average of 3.3 ppm; barium ranged from 34.9 to 136 ppm, averaging 98.28 ppm; and chromium ranged from 3.73 to 12.5 ppm, with an average of 8.10 ppm. Lead, one of the contaminants of concern listed in the ROD (EPA 1996), has no value reported in the background sampling results (CDM 1994). Note that the tables of sampling results in CDM (1994) do not provide a distinction for contaminants not analyzed for and those that were analyzed for but were undetected. However, the complete (several 600+ page compilations) of sampling results from the analytical laboratory are available in the Administrative Record (2002), under the key words "North Slope."

Acetone was detected at a level of 20 ppb in the sample from site H-83L, but no other volatile organic compounds (VOCs) were detected in any other samples. DDT, dichlorodiphenyl dichloroethane (DDD), and DDE were detected in several of the samples, with a high value of 12.9 ppb for DDT (found in three samples). DDE was found in two samples at less than 2 ppb, and DDD was found in only one sample, at 8.02 ppb. Three phthalate compounds were detected in varying concentrations throughout the samples. Bis-(2-ethylhexyl)phthalate was found in 7 of the 13 samples with concentrations from 120 to 4,500 ppb, averaging 1071.4 ppb. Di-n-butyl phthalate was found in one sample at a concentration of 1,800 ppb.

3.4 MIL-H-12L, "BATTERY B" NIKE MISSILE LAUNCH SITE (600-6)

The 0.5-ha (1.25-acre) MIL-H-12L Site (WIDS Code 600-6) is an abandoned "Battery B" Nike missile launch area. It is located northeast of the 100-F Area on the opposite side of the Columbia River. It is approximately 0.5 mile east of the White Bluffs Landing intersection.

The site was partially remediated by the Atomic Energy Commission (AEC) in 1974. Explosives were used to demolish two missile magazines in June 1974. According to Anonymous (1993), the structures on site included two sheds (paint and acid storage), a generator building, an oil tank, an 11,356-L (3,000-gal) UST, a 200-m (650-ft)-deep well, and a septic system. The Anonymous report states that "The structures listed above sold to Washington State University and removed from site." In 1990, the site consisted of concrete foundation pads, a backfilled underground storage area, a 0.9- to 1.2-m (3- to 4-ft)-deep excavation, and a large soil depression at the northwest corner of the site. The large soil depression in the northwest corner of the site was suspected to be a disposal area, based on a general disturbance pattern within the nearby soil (Roos 1990, DOE-RL 1994c).

No evidence of the UST remained in 1990 (Roos 1990). DOE-RL (1994c) reports that geophysical surveys at three of the other military sites (PSN-04, H-06H, and H-83L) failed to detect the presence of the USTs, and proposes that any tanks may have been removed during deactivation activities.

In 1993, Lucas (1993) sampled a 1.5- by 12.2-m (5- by 40-ft) acid pit at the missile fueling area (samples B07KR3 and B07KR4 sent offsite for analysis; Appendix A, Table A-2 presents a summary of the sampling results) for metals (results reported on pages G-15 and G-16 of DOE-RL 1994c). There were no identified environmental hazards. The pH at three locations in the pit ranged from 5.9 to 6.5. This sampling was used as an analogous site for the acid pits at two other Nike missile launch sites, H-06L and H-83L (DOE-RL 1994c).

Site H-12L received a geophysical investigation to identify potential anomalies in two landfill locations. No metallic anomalies were identified at H-12L, but areas of elevated conductivity were considered to be either increased salinity or moisture, or possibly an electrically conductive leachate originating from contamination (Smith and Rhoades 1994). CDM (1994) evaluated the results and reported that the geophysical investigations yielded no evidence of buried wastes, so no excavation work was done at H-12L.

At the H-12L site, a storage bunker and a valve pit were backfilled with concrete slurry in 1993 and 1994 and debris was removed in 1994 (Shannon & Wilson 1994a, 1994b). No further action was required for this site following the ROD (EPA 1996).

Roy et al. (1998) sampled for DDT, DDE, DDD, aldrin, dieldrin, endrin, and heptachlor in mice (three samples), darkling beetles (two samples), and Swainson's hawk plasma (one sample) in 1998. The maximum result for mice was 0.03 ppm DDE. For darkling beetles, the maximum result was 0.07 ppm for DDE. The other results were below the method reporting limit.

Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.5 NIKE ASBESTOS PIPE SITE, CONCRETE/ASBESTOS PIPE SITE (600-7)

This site is associated with demolition activities at the H-12L Nike Missile Launch site (600-6), which is located only a quarter of a mile north. This site is located northeast of the 100-F Area but on the opposite side of the Columbia River.

Demolition activities at waste site 600-6 are believed to be the reason for the debris found on this waste site. The site is a depression in the ground that contained miscellaneous construction debris and parts of concrete/asbestos pipe. A visual inspection in 1993 as part of the North Slope ERA investigations reported visual sightings of asbestos pipe (Roos 1990). Shannon & Wilson

(1994b) document the task completion of "Pickup and remove concrete asbestos pipe and small amount of debris" (DOE-RL 1994c, page K-15) in Table 1. No samples were collected.

Because the final cleanup of the site was completed as a landlord action and did not need to be done under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.6 MIL-H-06C, CONTROL CENTER FOR BATTERY A NIKE MISSILE, WAHLUKE SLOPE NIKE MISSILE BASE (WSNMB) (600-8, PART OF 600-103)

This site is an abandoned military installation that had associated buildings and facilities, plus two 7,600-L (2,000-gal) USTs, and one aboveground, 5,700-L (1,500-gal) oil tank (Anonymous 1993). This site is located at the summit of the Saddle Mountains where the road terminates.

Originally this site, together with Nike Launch Site H-06L (600-9), was listed as a single site called 600-103, Wahluke Slope Nike Missile Base. Tri-Party Agreement change request C-96-02 deleted the 600-103 site from WIDS after splitting it into two sites, 600-8 and 600-9.

In the document *Air Defenses of Hanford: Camp Hanford Forward Positions 1950-1964* (Anonymous 1993), the descriptive summary states that all buildings on this site were sold to Washington State University, which then removed all structures and cleaned up the site. The North Slope ERA investigation was conducted in 1992, but it did not include any sampling, although it did visually identify that there were no remaining environmental hazards (DOE-RL 1994c). Shannon & Wilson (1994b) report that while removal of debris at this site was one of their tasks, it was not done (except along the road) because of safety concerns. The debris was in a deep pit, the bottom of which was covered with large rocks. The safety analysis was agreed to by the U.S. Army Corps of Engineers and the DOE (Shannon & Wilson 1994b).

Remaining material consists of concrete foundation pads, small amounts of garbage including a 19-L (5-gal) and a 208-L (55-gal) drum found over a nearby cliff in the "saddle."

No further action was required for this site following the ERA according to the ROD (EPA 1996). The site was deleted from the NPL on July 8, 1998 (DOE-RL 2002).

WIDS Status: Deleted from the NPL.

3.7 MIL-H-06L, BATTERY A NIKE MISSILE INSTALLATION LAUNCH SITE, SLOPE NIKE MISSILE BASE, (WSNMB), (600-103 AND 600-9)

The site is located north of the 100-F Area on the opposite side of the river and 1.6 km (1 mi) north of Highway 24 at mile marker 62.5. It is an abandoned military installation that included an 11,360-L (3,000-gal) UST, an oil tank, generator building, dog kennels, septic system, acid storage shed, well, an underground bunker, a 208-L (55-gal) drum "drywell," and two associated landfills (Anonymous 1993, DOE-RL 1994c). Roos (1990) reported that foundations, roadways, and drainage structures remained. He said that while the approximate location of the UST was known, removal during the excess operations (in the 1970s) was likely. Debris was evident on the surface of the dumping area.

Originally this site, together with the Nike Control Center H-06C (600-8), was listed as one site called the Wahluke Slope Nike Missile Base (600-103). Tri-Party Agreement change request C-96-02 deleted the 600-103 site from WIDS after splitting it into two waste sites, 600-8 and 600-9.

All surface structures have been removed or leveled from site 600-9 (H-06L). A building foundation, roadways, parking areas, and drainages are the only remaining structures. There was no evidence of a UST during remedial activities, and it was assumed that the tank was removed during excess operations in the 1970s. In 1974 Anonymous (1993) initiated an official cleanup that demolished the two missile magazines by use of explosives and sold the structures to Washington State University. The 208-L (55-gal) drum drywell and a rock-filled pit (4-m [13-ft] depth) were sampled (sample numbers B07KQ2 and B07KQ3, respectively; Appendix A, Table A-2 presents a summary of sample results) and backfilled with bentonite during the North Slope ERA investigations in 1992 (Lucas 1992). The results of the testing showed no signs of environmental hazards (DOE-RL 1994c). The underground bunker was filled with 22 m³ (29 yd³) of concrete slurry in 1993 (Shannon & Wilson 1994b).

The two associated landfills were remediated to remove debris found during geophysical surveys. Each of the anomalies found during these surveys (25 locations in the west landfill and 19 in the east landfill) were excavated for examination, testing, and removal of the debris (CDM 1994). Table 4.1 of CDM (1994) details the wide variety of debris found at the anomalies excavated, including construction debris, oil filters, light bulbs, batteries, car frames, 208-L (55-gal) drums, transite, sheet metal, roofing tar, empty insecticide cans, bottles, dried paint, wood, shoes, rags, paper, food cans, silverware, auto engines, and a toilet bowl. (See the section above on *North Slope Landfill Investigations* for other details on the excavation of this landfill.) Table 4-4 of CDM (1994) describes the media and location of each of the samples taken from the landfills.

Samples of the soil and debris from these landfills were used to determine waste disposition, remediation effectiveness, and quality assurance (QA)/quality control checks. The sampling results are summarized in the 1996 ROD (EPA 1996) for this site and in CDM (1994). Because this site served as an analogous site for all the other military landfills, and because of the elevated levels of contamination found at this site, Ecology and EPA requested that all the military landfills be characterized and remediated as necessary (DOE-RL 1994b).

This site was assumed to have an acid neutralization pit, based on facility drawings, but field investigators were unable to locate it at this site. Using the analogous approach, the pit at Site H-12L (600-6) was sampled. No areas of contamination above regulatory limits were detected (CDM 1994).

Roy et al. (1998) sampled for DDT, DDE, DDD, aldrin, dieldrin, endrin, and heptachlor in mice (three samples) and darkling beetles (five samples) in 1998 at this site. The maximum results for mice were 1.7 ppm DDD and DDT (estimated for DDD) and 1.64 ppm for DDE. For darkling beetles, the maximum result was 0.51 ppm for DDE and 0.05 ppm for DDT; the levels of DDD were not provided but at very low concentrations, possibly from analytical interference. The other pesticides were below the method reporting limit.

In May 1999, the eastern portion of the H-06-L Site (numbered H-06-LE) was sampled and characterized by Linville et al. (1999). Samples consisted of ground-dwelling invertebrates (darkling beetles) and eggs from western meadowlark (*Sturnella neglecta*). Insect and bird surveys were also performed at the site. Results of the study indicated that DDE was present at an average concentration of 0.372 ppm in insects, and at 1.0 ppm in one composite sample of four meadowlark eggs (Linville et al. 1999).

No further action was required for this site following the ERA according to the ROD (EPA 1996). The site was deleted from the NPL on July 8, 1998 (DOE-RL 2002).

WIDS Status: Deleted from the NPL.

3.8 MIL-H-12C, BATTERY B NIKE MISSILE CONTROL CENTER (600-10)

The MIL-H-12C Site (WIDS site code 600-10) was a military installation that functioned as the control center for the Battery B Nike Missile Site H-12L (DOE-RL 1994c). The site is located northeast of the 100-F Area at the road terminus west of PSN 12/14 and about 5 km (3 mi) east of the White Bluffs landing.

This site is associated with the MIL-H-12L Battery B Launch Site (600-6). A communication wire ran from the control area to the launch area at the 600-6 Site. A bulldozed trench was present north of the control center, but there was no evidence of buried materials (Roos 1990). Anonymous (1993) initiated a cleanup effort in 1974 to remove all structures, listed as a storage shed and pumphouse with a 5,730-L (7,500-gal) water tank (no UST is listed). The structures were sold to Washington State University. The site also had a well and a septic tank and drain field (Anonymous 1993). Roos (1990) found a 19-L (5-gal) military lubricant can with a small amount of product and dead beetles that had soaked up all the free material. A visual inspection conducted as part of the 1992-1993 North Slope ERA found no sign of environmental hazards (DOE-RL 1994c).

A geophysical survey (over an area of 60 by 18 m [200 by 60 ft]) identified no anomalies or underground tanks (including septic) at the site (Smith and Rhoades 1994). Debris, such as building materials, cable, glass bottles, tin cans, several paint and lubricant cans, and barbed

wire, was removed in 1994 (Shannon & Wilson 1994b). No samples were collected. No evidence of the septic system remains.

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of the site was completed as a landlord action and did not need to be done under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.9 MIL-H-81R (600-11)

The 0.2-ha (0.5-acre) MIL-H-81R Site was located near PSN 80 to support the anti-aircraft gun system. By 1955, the MIL-H-81R Site was moved near the 83-C Battery C Control Center (600-12). The nature of the equipment and structure (if any) are unknown (Anonymous 1993). Little remains of the surface structures normally associated with these installations. The only waste on site during the Roos (1990) evaluation was random surface debris such as batteries and bottles, and one buried, open-top 208-L (55-gal) drum. An ERA investigation (Lucas 1992) conducted on December 14, 1992, collected one soil sample (B07KQ1) from the drywell. The sample was analyzed for VOCs, SVOCs, metals, TPHs, PCBs, and pesticides (Appendix A, Table A-2 presents a summary of sample results). Asphalt was found at a depth of about 1.2 m (4 ft). The sampling results showed elevated TPH at 910 ppm (DOE-RL 1994c).

In 1994, the debris (concrete and rebar, oil filters, pipes, glass bottles, tin cans, wire, wood, and other garbage) was removed and a rifle pit (bunker) was backfilled. On November 8, 1993, two samples were collected from the site and analyzed for TPH; the results showed 14,000 ppm (sample number 93-H81R-S3-S0) and 42,300 ppm (sample number 93-H81R-S2-S0) (Shannon & Wilson 1994a). A sample (93-H81R-S1-S0) was also taken at the site for PCB/pesticides, with the results showing 4,4'-DDE at 41 ppb and endrin aldehyde at 2.2 ppb (Shannon & Wilson 1994a). On November 17, 1993, the contaminated soil was taken to the Richland Landfill, but no follow-up sampling results are available to confirm removal of all contaminants (Shannon & Wilson 1994a, 1994b).

Roy et al. (1998) sampled for DDT, DDE, DDD, aldrin, dieldrin, endrin, and heptachlor in darkling beetles (two samples) in 1998. The maximum results were 0.11 ppm DDE and 0.01 ppm for DDT. The other pesticides were below the method reporting limit.

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of the site was completed as a landlord action and did not need to be done under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.10 MIL-H-83C, BATTERY C CONTROL CENTER (600-12)

This 0.9-ha (2.3-acre) waste site is an abandoned military installation that operated as the control center for the Battery C Nike Missile site. It is located northwest of the 100-B/C Area on the opposite side of the Columbia River about 0.4 km (0.25 mi) east of the north-south "L SW" Road, near the top of the bluff. Anonymous (1993) reports the only structures as one 13,250-L (3,500-gal) water tank and one 5,680-L (1,500-gal) diesel UST, with a 198-m (650-ft) well and a sewer system. The condition was reported as "Destroyed."

The concrete well structure on site has been excavated (Shannon & Wilson 1994b).

Two drywells, present in the original drawings of the site, were not found during a 1992 GPR survey (Lucas 1992, DOE-RL 1994c). A second GPR survey (Smith and Rhoades 1994, CDM 1994) over about 0.8 ha (1.9 acres) of the site revealed a single, large anomaly in the eastern portion of the survey grid, indicative of buried metal within 1.5 m (5 ft) of the surface. Three anomalies, likely reinforced concrete structures (possibly foundations) and a buried pipe between two of the probable foundations, were also discovered.

One of the three anomalies found during the geophysical survey was excavated and found to be demolition debris and a concrete slab. No samples were taken of the debris, but two background samples (B0C3C4 and B0C3C5, a duplicate; Appendix A, Table A-2 presents a summary of sample results) were taken from the site in 1994, analyzed for VOCs, SVOCs, pesticides/PCBs, metals (including lead and mercury), and TPHs. These samples were used as part of the background sampling for the other military landfill sites (CDM 1994).

There was a small pit, about 1.2 by 0.5 m (4 by 1.5 ft), that contained several hundred rounds of fired 30/06 blank ammunition along with steel links for belt-fed automatic weapons. Several tires were found near a small trench to the west of the site, indicative of a waste disposal area; however, there was no documented evidence of waste disposal (Roos 1990, DOE-RL 1994c).

The Air Defense of Hanford: Camp Hanford The Forward Positions 1950-1964 descriptive summary (Anonymous 1993) also lists a 5,680-L (1,500-gal) diesel UST, 13,250-L (3,500-gal) water tank, and a septic tank and drainfield. Anonymous (1983) also states "Present Condition: Destroyed." No evidence of a UST was found during the GPR survey (CDM 1994).

In 1993, the septic tank was filled with concrete slurry and the debris (building materials, 20 tires, bottles, wire, pipe, sheet metal, and other garbage) was removed (Shannon & Wilson 1994b).

Roy et al. (1998) sampled for DDT, DDE, DDD, aldrin, dieldrin, endrin, and heptachlor in mice (three samples), bird eggs (three samples), and darkling beetles (two samples) in 1998. The maximum result for mice was 0.02 ppm DDE. For bird eggs, the maximum DDE was 0.26 ppm and for DDT was 0.12 ppm. For darkling beetles, the maximum result was 0.05 ppm of DDE. The other results were below the method reporting limit.

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of the site was completed as a landlord action and did not need to be done under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.11 MIL-H-83L, BATTERY "C" LAUNCH SITE (600-13)

This 2.8-ha (7-acre) site is an abandoned Battery "C" Launch Site (WIDS site code 600-13). It is located northwest of the 100-B/C Area on the opposite side of the Columbia River at the end of a paved access road.

The Air Defenses of Hanford: Camp Hanford The Forward Positions 1950-1964 descriptive summary (Anonymous 1993) states there were 15 aboveground structures (including barracks, paint, oil, and acid storage), a septic system, and assorted "miscellaneous tanks." The barracks were located about 0.4 km (0.25 mi) away from the launch site. The summary also reported that the site is "destroyed;" the AEC cleanup was from May to July 1974. The ammunition magazines were detonated in June 1974. The adjacent PSN 80 was merged with this site after 1956 (Anonymous 1993).

All the aboveground structures have been removed, and all the underground launch structures and the well were backfilled (DOE-RL 1994c). A 1992 geophysical survey (WHC 1992) of the landfill identified several anomalies that were later sampled (six samples, numbers B07GM0 through B07GM5, pages 17 and 65 in Lucas 1992) by using borehole augers to dig to depths of 3 to 3.4 m (9 to 11 ft) below surface in 10 locations (Lucas 1992). Field screening for organic vapors in the 10 boreholes showed up to 5.4 ppm, but most results were 0.0 ppm (Lucas 1992). The laboratory samples were analyzed for pesticides, VOCs, SVOCs, and metals (Appendix A, Table A-2 presents a summary of sample results). There were no identified environmental hazards identified in the samples or remaining on site (sample results reported in DOE-RL 1994c).

In 1994 the North Slope ERA investigation conducted a geophysical survey over a larger area than the WHC (1992) survey (CDM 1994). There was a large disposal area north of the site that contained debris from practice maneuvers performed in the 1960s, but no burial trenches were identified. A possible disposal site existed to the west of the site and where an unusual amount of trash was scattered over a 20-ha (50-acre) area. In 1993 and 1994, the debris at the site was removed or burned. A run of communications wire from H-83L to H-83C was removed. Three septic tank openings and an unidentified metal pipe with a flange (a possible additional buried tank) were noted in 1993, but no further mention of the tanks was made in the logbooks or geophysical surveys. The wood debris found on site was burned, and the nonwood debris was removed (Shannon & Wilson 1994b).

Oil-stained soil at the location of the 64 one-quart lubricating-oil cans was sampled and found to contain up to 14,900 ppm of heavy oils. On June 16, 1994, about 1.5 m³ (2 yd³) of the

oil-stained soil was removed; one sample (94H83L-A06-01-001 [B0C399]) was taken of the contaminated material from this location (anomaly A6) and one sample (94H83L-A03-01-005 [B0C3B5]) of oily soil was taken from within a 19-L (5-gal) container at anomaly A3. Sample B0C399 showed 14,900 ppm and B0C3B5 showed 168,000 ppm hydrocarbons. Confirmatory samples taken from 0.6 m (2 ft) below grade at anomaly A6 were taken to ensure that all the contamination was gone. Heavy oils, diesel, gasoline, VOCs, SVOCs, and pesticides/PCBs were not detected in either the confirmatory sample or the split (samples 94H83L-A06-02-002 [B0C3B1] and 94H83L-A06-03-002 [B0C3B2]) (CDM 1994, EPA 1996).

This site had an acid neutralization pit, which was located in the field. Using the analogous approach, the pit at Site H-12L was sampled for all three launch sites (including site H-06L). No areas of contamination above regulatory limits were detected (CDM 1994).

Roy et al. (1998) sampled for DDT, DDE, DDD, aldrin, dieldrin, endrin, and heptachlor in bird eggs (one sample) and red-tailed hawk plasma (one sample) in 1998. The results for the bird egg were not provided; the red-tailed hawk results were below the method reporting limit.

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.12 MIL-PSN 01 (600-14)

This 0.12-ha (0.3-acre) waste site was an abandoned military tent camp and anti-aircraft battery site. The site is located north of the Columbia River and north of Highway 24 in the Wahluke Slope State Wildlife Recreation Area. The site is located about 1.6 km (1 mi) north of Highway 24 at marker 56 and can be accessed via Gate 136.

The site had a well drilled in 1953 that was 272 m (892 ft) deep, with a 6.1- by 10.4-m (20- by 34-ft) aluminum pre-fabricated pumphouse with a concrete floor and foundation, plus a 2,082-L (550-gal) UST. The site also had a septic system and a direct communications cable connection with Headquarters Site H-03-H, which was in the central region of the Hanford Site south of the 100-N Area. The AEC terminated the use permit for this connection on December 21, 1960. After the site was closed as an AAA site, a repeater was all that remained operational. As of September 30, 1960, only the sanitary sewer system, roads, sidewalks, and parking areas remained (Anonymous 1993).

In 1990, the well structure was considered a possible attractive nuisance, and several areas to the west, south, and north of the main area appeared to be disposal sites (Roos 1990). 1993 ERA investigations stated there were no environmental hazards identified with the remaining well structure and disposal areas (DOE-RL 1994c). A geophysical survey of a 49- by 27-m (160- by 90-ft) suspected landfill did not show any areas of buried wastes or tanks (CDM 1994, Smith and

Rhoades 1994). No samples were collected and surface debris, including barbed wire, wood, cable, bottles, concrete pipe, and garbage, was removed. An excavation around the well structure was completed in 1993 (Shannon & Wilson 1994a, 1994b).

During a visit in April 1999 (DOE-RL 2002), no foundations were found, but there were several regularly shaped disturbed areas and scattered chunks of concrete. The well was covered with a removable metal cover and there was an area of erosion or subsidence that had exposed concrete along the edges. There were several circular areas that had little to no vegetation, but mature trees, grasses, and 0.6- to 1.2-m (2- to 4-ft)-tall sagebrush covered the rest of the site. There was no record of removal or backfilling for the underground septic tank and drain field, so it is possible that they are still on site.

Roy et al. (1998) sampled for DDT, DDE, DDD, aldrin, dieldrin, endrin, and heptachlor in mice (three samples), bird eggs (one sample), darkling beetles (three samples) and Swainson hawk plasma (one sample) in 1998. The maximum result for mice was 0.33 ppm DDE. For the magpie egg, the maximum DDE was 0.66 ppm. For darkling beetles, the maximum result was 0.37 ppm for DDE and 0.02 ppm for DDT. The other results were below the method reporting limit. Appendix A, Table A-2 presents a summary of sample results for the site.

In May 1999, the site was sampled and characterized by Linville et al. (1999). Samples consisted of ground-dwelling invertebrates (darkling beetles). Insect and bird surveys were also performed at the site. Results of the study indicated that DDE was present at an average concentration of 0.444 ppm in insects at the site (Linville et al. 1999).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.13 MIL-PSN 04 (600-15)

This 2-ha (5-acre) waste site is an abandoned tent camp and anti-aircraft battery. The site is located north of the 100-H Area on the opposite side of the Columbia River. Structures on site included an administration building, latrine, supply building, a 343-m (1,123-ft) well, and barracks. No mention is made of fuel tanks (Anonymous 1993).

Roos (1990) found several blue, plastic 208-L (55-gal) drums in a gully at the site. Six of the drums had 20- to 25-cm (8- to 10-in.) holes cut into the tops and were labeled "Sterling Imaging, Pasco, WA." According to Sterling, the drums most likely contained photographic fixatives, mainly acetic acid, ammonia dithiosulfate, and sodium sulfite. Three of the drums were cut in half and most likely used as animal feed and watering troughs. The well at this site was marked "Contaminated," but was dry at the time of investigation. It was suspected to be contaminated with pesticides (Roos 1990). The site had a septic system and an "interesting complex of four

subterranean wooden chambers arranged in a row parallel to the entry road; purpose unknown. Suspected early 1950's ammunition storage. Filled in by DOE in 1989(?)" (Anonymous 1993).

VOC samples were taken as part of a field screening during the drilling and sampling of 11 boreholes on October 20 and 21, 1992. The maximum reading of VOC was 0.6 ppm. Eight laboratory samples, including two QA samples, were also taken at that time (sample numbers are B07GM6 through B07GM9 and B07GN0 through B07GN3; Appendix A, Table A-2 presents a summary of sample results) (Lucas 1992).

Two geophysical surveys were performed at PSN-04 as part of the North Slope ERA investigations, one in 1992 and the second in 1994 (WHC 1992, CDM 1994). Four areas totaling 2.1 ha (5.3 acres) at PSN-04 were surveyed. Several anomalies were discovered, including concrete, pipes, and metallic objects (one identified as a possible vault). CDM (1994) reports that a partially full 208-L (55-gal) drum was found during excavation of the anomalies. Samples showed low concentrations of polycyclic aromatic hydrocarbons in the tar-like material in the drum, but there was no evidence of contaminated soil in the trench surrounding it. The drum was then sent to the Hanford Central Landfill.

Two composite samples were collected from the six excavations after remediation was complete: 94PSN04-A1/4-004 and 94PSN04-A04/05-003 (these samples were also numbered B0C3F8 and B0C3G0). Another equipment rinsate blank (94PSN04W-A05/06-01-EB1 [B0C3G4]), a background sample 11.6 m (38 ft) east of the site (94PSN04(S)-BG01-001 [B0C3F9]), and a sample of the sludge in the drum (94PSN04-DS-001-02 [B0C3F7]) were also taken. The excavation soil samples were verified clean with no detectable levels of petroleum hydrocarbons or heavy oils (CDM 1994, EPA 1996).

In 1994, the debris at this site was removed, the well structure removed, and the septic tank was backfilled (Shannon & Wilson 1994b).

Roy et al. (1998) sampled for DDT, DDE, DDD, aldrin, dieldrin, endrin, and heptachlor in mice (three samples), bird eggs (three samples), and darkling beetles (one sample) in 1998. The maximum result for mice was 0.43 ppm DDE. For bird eggs, the maximum DDE was 0.68 ppm and for DDT was 0.028 ppm. For darkling beetles, the maximum result was 0.17 ppm for DDE and 0.02 ppm for DDT. The other results were below the method reporting limit.

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.14 MIL-PSN 07/10, PSN 10, H-07-H, BASE CAMP 500 (600-16)

This waste site was originally named PSN 10, AAA Battalion Headquarters, and then the name of the site changed to H-07-H, Nike Battalion Headquarters. This waste site is located north of the 100-F Area on the opposite side of the Columbia River about 366 m (400 yd) north of Highway 24 at mile marker 62.5.

Originally, this site consisted of several pre-fabricated, metal buildings, barracks, a 194-m (636-ft) well, a gas station with a 45,425-L (12,000-gal) gas tank, and a septic system. The AEC reported the condition of the site as destroyed (Anonymous 1993). An ERA was conducted in 1993 (DOE-RL 1994c). Before the final cleanup performed between 1993 and 1994, the site consisted of a 0.9- by 2.4- by 0.4-m (3- by 8-ft by 18-in.) wooden underground structure, a grease pit, a concrete-lined pit, building foundations, and a french drain constructed from two 208-L (55-gal) steel drums (Anonymous 1993).

The dry well associated with the grease pit was excavated and sampled, but no environmental hazards were identified or areas of contamination above regulatory limits (samples B07KR5, B07KR6, B07KR7; Appendix A, Table A-2 presents results) (Lucas 1993, DOE-RL 1994c). The remaining debris was removed from the site, the underground structure was filled with slurry in 1994, and the concrete well structure was excavated (Shannon & Wilson 1994b).

Part of this site is the nearby location of the "Land Mine Site" (not a separate WIDS site). At this location, two practice antitank mines were found in 1989, in what appeared to be a mine field. The mines were removed by the U.S. Army, Yakima Firing Center in 1989. According to Roos (1990), the Army personnel said that the mines appeared to be only 2 to 3 years old. The area they were found in is about 91 by 91 m (100 by 100 yd), and was surrounded by 46-cm (18-in.) posts. The Army swept the area, and no additional mines or other unexploded ordnance were found (DOE-RL 1994c).

Roy et al. (1998) sampled for DDT, DDE, DDD, aldrin, dieldrin, endrin, and heptachlor in mice (three samples), bird eggs (five samples), darkling beetles (two samples), and red-tailed hawk plasma (one sample) in 1998. The maximum result for mice was 0.10 ppm DDE. For bird eggs, the maximum DDE was 9.6 ppm, DDT was 0.22 ppm, and aldrin was 4.4 ppm. For darkling beetles, the maximum result was 0.05 ppm for DDE and 0.03 ppm for DDT. The other results were below the method reporting limit.

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.15 MIL-PSN 12/14 SITE AND MILITARY DUMP, TENT CAMP 505, PSN 12, H-14 (600-17)

This site is 5.7 ha (14 acres), including the nearby motor pool dump (site 600-74). It is an abandoned military installation that included a small burial site on the southern edge, a large dump southeast of the camp in a shallow gully, a well, and a 2.4- by 2.4-m (8- by 8-ft) underground room (Roos 1990). Site 600-74 is a dumping area to the northeast. The site is located at the end of the road leading east from the White Bluffs landing.

The site was originally an anti-aircraft gun location designated as H-12 that was later changed to support the Nike missile position and was then renamed H-14 to reflect this change. Anonymous (1993) listed some of the structures at the site as a latrine with a septic system and a 3,785-L (1,000-gal) UST, two generator sheds, craft shop, administration building, and several other metal prefab buildings, such as day rooms, barracks, and messhall. Anonymous (1993) reported the site as destroyed.

Roos (1990) reported no indications of USTs at the site, but did find paint cans, 4-L (1-gal) solvent cans, and artillery packing tubes for 120-mm shells. The artillery packing tubes were confirmed empty and were about 120 mm in diameter and 0.5 m long, marked "120 M." All the buildings were confirmed as removed.

The "PSN 12/14 Site (Military Dump)" is part of this site, southeast down the hill. (The other dumping area, 600-74, is northeast of the site, and referred to as the "PSN 12/14 [Motor Pool]" in Shannon & Wilson 1994b or "Military Construction Dump" in DOE-RL 1994c.) A geophysics survey was done in 1994 over a 214- by 366-m (700- by 1,200-ft) area of the military dump (Smith and Rhoades 1994). Many anomalies that indicated buried debris were found. Seventeen of these anomalies were excavated, with a wide variety of debris, including oil cans and filters, metal scraps, paint cans, commissary-type wastes (e.g., food cans, condiment containers, and beer bottles), washing machine parts, a water tank, a water heater, and 4-L (1-gal) solvent cans (CDM 1994). Visual surveys revealed no environmental hazards.

Two samples were collected, one (B0C3C6, also known as 941214-BG1-01-002) was a background sample from the site and the other (B0C3C7, also known as 941214-WC1-01-000) was a composite sample of oily soils from anomalies A-1 and A-3 (CDM 1994), to be used for proper disposal of the soils. Petroleum hydrocarbons were at 65,000 ppm; other analytes detected were aldrin at 6.35 ppb, alpha-BHC at 2.52 ppb, DDE at 21.3 ppb, DDT at 6.37 ppb, endrin at 194 ppb, heptachlor at 26 ppb, and acetone at 17 ppb (CDM 1994). Appendix A, Table A-2 presents a summary of sample results.

The well structure was excavated (Shannon & Wilson 1994a, 1994b), but there is no mention of the proposed or final disposition of the open underground room reported by Roos (1990) in the cleanup plan (DOE-RL 1994c) or final report (DOE-RL 1994a). Field visits in 2001 (DOE-RL 2002) showed no evidence of the open underground room, so it is assumed that it was filled in during the cleanup activities. No evidence of the septic system remains visible.

This site is associated with waste site 600-74, Wahluke Slope PSN 12/14 Military Construction Dump, Motor Pool Dump, which is located northeast of the 600-17 site and was probably another dumping ground for waste site 600-17. See site 600-74 for a discussion of the confusion and inconsistencies in the names of these sites. The multiple names for these two sites and their physical proximity has frequently caused them to be lumped together as one waste site.

Since the completion of cleanup activities, the excavated debris landfills at the site have been revegetated with native species. Vegetation monitoring results were published annually for 5 years after revegetation in the Environmental Restoration Contractor Revegetation Monitoring Report (see Johnson et al. [2000] for the last of the 5 years of monitoring).

Roy et al. (1998) sampled for DDT, DDE, DDD, aldrin, dieldrin, endrin, and heptachlor in mice (four samples), bird eggs (five samples), darkling beetles (three samples), and Swainson's hawk plasma (one sample) in 1998. The maximum result for mice was 0.04 ppm DDE. For bird eggs, the maximum DDE was 4.0 ppm and for DDT was 0.029 ppm. For darkling beetles, the maximum result was 0.06 ppm for DDE and 0.02 ppm for DDT. The other results were below the method reporting limit.

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.16 MIL-PSN 72/82, PSN 72, H-82, TENT CAMP 515, BRIDGE OVERLOOK 2 (600-18)

This 0.3-ha (0.7-acre) site is an abandoned military tent camp site. It is located northwest of the 100-B/C Area on the opposite side of the Columbia River. The site is on both sides of a small highway heading north from Vernita Bridge around a group of trees at the top of the hill.

Anonymous (1993) reported the site to be an anti-aircraft battery, with a pumphouse that contained a 1,900-L (500-gal) UST and a septic system. It also reports that all the facilities and structures (except for the sewer system and roads) were removed during the 1974 Anonymous cleanup. Roos (1990) reported the site to be a few small disposal pits located west of the road and a small firing range located at the northeast corner of the unit. Two buried plywood boxes (0.6 m by 1.2 m [2 ft by 4 ft]) were identified with their tops flush against the ground surface. One box contained empty 19-L (5-gal) cans of lubricant.

In 1993, a visual site inspection was performed under the ERA (DOE-RL 1994c). No environmental hazards were identified and no samples were taken. In 1994, the septic tank was filled with concrete slurry and the two rifle pit/bunkers were cleaned out and backfilled (Shannon & Wilson 1994b).

The variety of names provided for this site in the individual reports in DOE-RL (1994a) serve to make determination of the work completed difficult. It is referred to in some places as PSN 72/82, but also as both the Bridge Overlook Site 1 and Bridge Overlook Site 2 in the site geophysical survey and landfill excavation reports, with contradictory entries (CDM 1994, Smith and Rhoades 1994, Shannon & Wilson 1994a). One of the Bridge Overlook sites is site 600-95, a place where building debris was placed when the camp was destroyed.

Regardless, the geophysical surveys found anomalies in four locations of the overlook sites. Approximately 92 m³ (120 yd³) was excavated from the anomalies, with an unknown amount removed from the site. Miscellaneous surface debris, including lumber, bricks, communications wire, bottles, tin cans, paint cans, an oil filter, solvent cans, cable, a 57-L (15-gal) drum of grease partially filled with water, an old trailer frame, and other garbage, was removed and properly disposed of according to regulations. A concrete well structure on site has been excavated. No samples were taken from either overlook site (CDM 1994; Shannon & Wilson 1994a, 1994b).

The disturbed parts of the site have been revegetated with native species. Vegetation monitoring results were published annually for 5 years after revegetation in the Environmental Restoration Contractor Revegetation Monitoring Report (see Johnson et al. [2000] for the last of the 5 years of monitoring).

Roy et al. (1998) sampled for DDT, DDE, DDD, aldrin, dieldrin, endrin, and heptachlor in mice (two samples), bird eggs (one sample), and darkling beetles (two samples) in 1998. The maximum result for mice was 0.52 ppm DDE. For the starling egg, the maximum DDE was 0.02 ppm. For darkling beetles, the maximum result was 0.06 ppm for DDE. The other results were below the method reporting limit. Appendix A, Table A-2 presents a summary of sampling results.

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.17 MIL-PSN 90, H-90 BASE CAMP 410 (600-19)

This 2-ha (5-acre) waste site is an abandoned anti-aircraft battery with a cinderblock well pumphouse (with a 2,082-L [550-gal] UST), a grease pit, wash platform, generator shed, septic system, and other support facilities (Anonymous 1993). Prior to cleanup in 1994, the site contained concrete foundation pads, an abandoned well, a usable well, a recently used oil rack (probably the wash rack reported by Anonymous [1993]), a grease pit, several trash pits, a 3- by 4- by 1.2-m (10- by 15- by 4-ft)-deep trench, and the associated dumping ground south of the highway. The oil rack had been used in recent years, and small amount of oil had been dumped on the ground (Roos 1990). The site is located north of the Columbia River in the

Saddle Mountain National Wildlife Refuge. The main part of the site is located north of Highway 24, with an attached dumping ground south of the highway.

The vehicle maintenance ramp was demolished during the 1992 ERA investigation, and there was "partial removal" of oil-saturated soils (Lucas 1992, DOE-RL 1994c). In February 1993, two samples were taken of this drummed soil for waste designation (B07KR9 and B07KS0) and two more samples (B07KS1 and B07KS2) were taken of the scraped area for offsite analysis (Lucas 1993) (Appendix A, Table A-2 presents a summary of sampling results). The drummed material showed up to 65,000 ppm of TPH and 1,200 ppm of lead; the bottom of the excavation showed up to 1,700 ppm of TPH and 120 ppm of lead. No other environmental hazards were identified (DOE-RL 1994c).

Additional samples were collected in July 1994: B0C3B8, a composite of clean soil from the base of the excavation at the vehicle maintenance rack; B0C3B9, a composite from the hydrocarbon contaminated soil pile excavated from the vehicle rack area; B0C3C2, a background sample taken about 110 m (360 ft) southeast of the rack; and B0C3C1, an equipment rinsate blank, split with the AEC QA laboratory (CDM 1994). The petroleum-contaminated excavated soil (sample B0C3B9) contained 3,000 ppb of 2, 4-dinitrotoluene; 490 ppb of DDT; and 3.22 ppb of dieldrin, and was shipped to the Chemical Waste Management Facility in Arlington, Oregon. The sample from the bottom of the excavation (B0C3B8) showed no pesticides or hydrocarbons.

The remaining debris was removed in 1993 and 1994 (Shannon & Wilson 1994a, 1994b). During an April 1999 visit, several concrete foundations and walkways were observed on site as well as a stone wall, earthen mounds, and a small brick structure. Mature trees were present around the abandoned installation. In July 2002, an inspection found that trash (an old refrigerator and household garbage) had been recently (within the last few months) dumped at the site (DOE-RL 2002).

Roy et al. (1998) sampled for DDT, DDE, DDD, aldrin, dieldrin, endrin, and heptachlor in mice (four samples), bird eggs (four samples), darkling beetles (two samples), and long-eared owl plasma (one sample) in 1998. The maximum result for mice was 0.11 ppm DDE. For bird eggs, the maximum DDE was 0.41 ppm. For darkling beetles, the maximum result was 0.22 ppm for DDE and 0.03 ppm for DDT. The other results were below the method reporting limit.

In May 1999, the site was sampled and characterized for the presence of DDT and DDE by Linville et al. (1999). Samples consisted of ground-dwelling invertebrates (darkling beetles). Insect and bird surveys were also performed at the site. Results of the study indicated that DDE was present at an average concentration of 0.066 ppm in insects (Linville et al. 1999).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.18 WAHLUKE SLOPE H-12-R DEBRIS SITE, H-12R (600-72)

This site is an abandoned military radar and dump site that runs east-west and measures approximately 2 ha (5 acres) in size. It is located northeast of the 100-F Area on the opposite side of the Columbia River, southeast of the H-12L site. A gravel road forms the perimeter of the site. Anonymous (1993) lists only that it is associated with the H-14 and H-12 sites, and possibly built after 1956. The nature of the equipment and structures (if any) are unknown.

A visual survey of the site was performed under an ERA in 1993 (DOE-RL 1994c). The survey did not identify any environmental hazards. In 1994 the debris (building materials, cable, glass bottles, tin cans, barbed wire, and auto parts) was removed from the site (Shannon & Wilson 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.19 WAHLUKE SLOPE IGLOO SITES (600-73)

This 0.5-ha (1.2-acre) site is where two ammunition storage units termed "igloos" were located. The site is located on the Wahluke Slope, north of the 100-D Area at the upper east and west ends of a "T-shaped" gravel road. Roos (1990) reported no evidence of hazards, and stated the area was generally clean except for several broken ammunition boxes.

Geophysical surveys performed on the two igloos identified two anomalies, one for each igloo. The anomalies measured 52 by 39 m (160 by 120 ft) and 102 by 52 m (310 by 160 ft), for Igloos 1 and 2, respectively. Each igloo site contained a large raised area that was sparsely vegetated. A strong response from the instruments at each of these raised mounds indicated metal within 1.6 m (5 ft) of the surface (Smith and Rhoades 1994). Excavations at the two igloo sites showed metal stripping (possible pallet banding) and a 20-cm (8-in.) concrete slab at 0.6 m (2 ft) below ground surface. No environmental hazards were identified, and no samples were taken (CDM 1994). Surface debris (stock watering drum, glass bottles, tin cans, barbed wire, and other garbage) was removed (Shannon & Wilson 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.20 WAHLUKE SLOPE PSN 12/14 MILITARY CONSTRUCTION DUMP, MOTOR POOL DUMP (600-74)

According to Roos (1990), this site was one large dump containing demolished wooden military buildings, with considerable construction debris, garbage, automobile parts (suggesting that some of the trash had been carted in from a military motor pool), and many 4-L (1-gal) and 19-L (5-gal) oil cans. The site is located 1 km ($\frac{2}{3}$ mi) north and east of waste site PSN 12/14 (600-17). The site extends from east to west near the borders of sections 13 and 24 in Section T14N R27E.

This site is associated with the MIL-PSN 12/14 (600-17) and the MIL-H-12C, Battery B Nike Missile Control Center (600-10) sites. It is suspected that this dump area was used as part of the 600-10 and 600-17 site demolitions.

There has been considerable confusion over the names used to refer to these sites, as the following summarizes:

- In the 1996 ROD (EPA 1996), the sites were named "PSN 12/14" for 600-17, "Construction Dump" for 600-74 (although it could also refer to the dump that is part of 600-17), and "H-12C" for 600-10. In addition, the map in the 1996 ROD appears to reverse the labels for the "Construction Dump" (600-74) and "PSN 12/14" (600-17); both associated dumps are to the east of PSN 12/14, not west.
- DOE-RL (1994c) refers to four sites in this area: "PSN 12/14 Disposal Area," which is part of 600-17; "PSN 12/14 and Well," which is also part of 600-17; the "Military Construction Dump," which is 600-74, and "H-12C," which is 600-10.
- Site 600-74 is referred to as the "PSN 12/14 [Motor Pool]" in Shannon & Wilson (1994b). And, CDM (1994, Figure 2-9) refers to the PSN 12/14 site as only the dumping area to the southeast, and does not include the part of the site on the top of the hill (the "PSN 12/14 and Well" site).

In summary, site 600-17 contains PSN 12/14 and the dumping area to the southeast, site 600-74 is the dumping area to the northeast, and site 600-10 is the control center to the west.

The debris was removed from this site in 1994 and included building materials, cables, glass bottles, tin cans, wire, and automobile parts (Shannon & Wilson 1994b). Visual inspections identified no environmental hazards, and no samples were collected (DOE-RL 1994c).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.21 WAHLUKE SLOPE PSN 80 DEBRIS SITE (600-75)

This site is located northwest of the 100-B Area on the opposite side of the Columbia River. According to Roos (1990), the site is similar to the H-12R site (600-72) and the "Radar" sites (600-76). It is roughly oval and surrounded by a gravel road. Roos found two locations with four small concrete pads with imbedded bolts, but thought that there should be three sets of pads. He found only one concrete building foundation, and no obvious disposal pits. The site contained a 160-m (522-ft) well and pumphouse, metal pre-fab buildings, and septic system, with no fuel tanks listed (Anonymous 1993). After 1956 the identity of the site was merged with Nike site H-83L (WIDS site 600-13), the use permit terminated in 1960, and the site later destroyed (Anonymous 1993).

During site cleanup, two septic tanks on site were filled with 12.2 m³ (16 yd³) of concrete. The well structure was excavated; the soil surrounding the well was contaminated. Debris, including building materials, insulators, glass bottles, tin cans, oil filters, communications wire, and cables, and five 208-L (55-gal) drums of petroleum-contaminated soil (from the well structure excavation) was removed from the site (Shannon & Wilson 1994b).

Roy et al. (1998) sampled for DDT, DDE, DDD, aldrin, dieldrin, endrin, and heptachlor in mice (two samples) and bird eggs (five samples) in 1998. The maximum result for mice was 0.12 ppm DDE. For bird eggs, the maximum DDE was 0.87 ppm. The other results were below the method reporting limit. Appendix A, Table A-2 presents a summary of sample results.

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.22 WAHLUKE SLOPE RADAR SITE, UNDERGROUND ROOMS (600-76)

This site is located on the Wahluke Slope north of the 100-H Area and Highway 24, southeast of waste site PSN 04 (600-15).

Roos (1990) reported that the site consisted of three separately located wooden underground rooms measuring 3 by 3 by 3 m (10 by 10 by 10 ft), of which two were intact and one had been destroyed. Each room had been roped off and signs posted to warn of the potential hazard posed as increasing age decreases the timber stability. No records were found in subsequent North Slope cleanup action documentation as to when the sites were demolished (e.g., DOE-RL 1994a). Northwest of each room is a set of concrete pads with exposed bolts that were used as a foundation for towers or large guns. The site cannot be found on military maps and is similar to PSN 80 and H-12R waste sites. It is slightly oval, measuring approximately 400 m (445 yd) by 370 m (400 yd) and surrounded by gravel.

The visual inspections performed under the North Slope ERA investigation revealed that no environmental hazards, and no samples were taken at the site (DOE-RL 1994c).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.23 WAHLUKE SLOPE SHRAPNEL SITES, ANTI-AIRCRAFT GUN SHRAPNEL SITES 1, 2, 3 (600-77)

This waste site is composed of three nearby but separate areas that contain shrapnel from anti-aircraft firing on the North Slope (Roos 1990, DOE-RL 1994c). Site 1 is located east of the 100-H Area and north of the electrical transmission lines, approximately 0.8 km (0.5 mi) north of the White Bluffs boat landing. Site 2 is located northeast of the 100-F Area, north of the railroad track, south of Highway 24, and northeast of PSN 12/14. Site 3 is located north of the 100-D Area and south of the Igloo Site in the Saddle Mountain National Wildlife Refuge Area.

In 1990, a North Slope investigation of Shrapnel Site 1 by the U.S. Army Explosive Ordnance Division speculated that this site was a demolition area where out-of-date or unusable shells were destroyed via detonation. The site was not consistent with an impact zone as there were no craters and shrapnel shards were in small pieces. No unexploded shells or large pieces of shells were found during this investigation (Roos 1990). Three site areas that displayed similar characteristics were identified, but only Site 1 was large enough to be marked on the map. No record has been found of the final removal of the shrapnel debris (DOE-RL 1994a).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.24 POWER POLE 12-3 CISTERN, 12-3 CISTERN (600-78)

This waste site is a single cistern measuring 1.5 m (5 ft) in diameter and 2.4 m (8 ft) deep. It is located east-southeast of the 100-F Area on the opposite side of the Columbia River. The site is located near power pole 12-3, and close to the point where the electrical transmission lines change direction from northeast to north.

The 1993 North Slope ERA investigation determined no environmental hazards, little debris in the cistern other than wood, and no unusual discoloration on site. No samples were collected

(DOE-RL 1994c). The debris was removed and the cistern was filled with gravel (Shannon & Wilson 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.25 WAHLUKE SLOPE CLAY PIT CISTERN (600-79)

The waste site is a clay pit cistern. The site is located near a pit that was used to obtain clay for lining irrigation canals. It lies northeast of the 100-H Area on the opposite side of the Columbia River, north of Highway 24, south of the Wahluke Branch Canal, and east of the White Bluffs Wasteway. In 1990 it was filled with tumbleweeds and debris (Roos 1990).

The cistern is a circular, concrete-lined pit approximately 1.7 m (5 ft, 6 in.) deep and 1.5 m (5 ft) wide. The debris on site was removed and the cistern was filled with 1.5 m³ (2 yd³) of pit-run gravel. An asbestos pipe on site was removed in accordance with the approved contractor safety plan along with the other garbage like the glass bottles and tin cans (Shannon & Wilson 1994b). No noticeable disposal pits are visible at the homestead. A sample (93-CPC-S1-S0) was taken at the site for PCB/pesticides, with the results showing the contaminants not detected (Shannon & Wilson 1994a).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.26 WAHLUKE SLOPE COW CAMP CISTERN (600-80)

The cistern at this waste site is about 1.4 m (4.6 ft) in diameter with an unknown depth. The site is located northeast of the 100-H Area, south of the Wahluke Branch Canal, and north of Highway 24.

The cistern was filled with debris during the original site investigations and has an unknown depth (Roos 1990). Later documents also fail to mention a depth for the cistern. Debris, including glass bottles, tin cans, and several empty bottles that used to contain antibiotics and pesticides used to delouse cattle, has been removed from the site. The cistern has been filled with about 1.5 m³ (2 yd³) of pit-run gravel (Shannon & Wilson 1994b). A sample

(93-CC-S2-S0) was taken at the site for PCB/pesticides, with the results showing that the contaminants were not detected (Shannon & Wilson 1994a).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.27 WAHLUKE SLOPE HOMESTEAD CISTERN (600-81)

This is a cistern that pre-dates Hanford. It is located east-northeast of the 100-F Area, southeast of the area where the north-south electrical transmission lines cross the east-west transmission lines (Roos 1990). The cistern is 1.5 to 1.8 m (5 to 6 ft) in diameter and 1.2 to 1.5 m (4 to 5 ft) deep. A soil sample (B07KQ4) was collected from the bottom of the well with a hand auger (Lucas 1992). The sample results showed 216 ppm lead and 4.5 ppb DDT (DOE-RL 1994c). (Appendix A, Table A-2 presents a summary of sample results.)

An ERA was performed in 1993 that backfilled the cistern with 2.3 m³ (3 yd³) of pit-run gravel. The debris was mainly homestead-associated food containers. Since the site predated Hanford, the debris was left on site as culturally significant artifacts (Shannon & Wilson 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.28 WAHLUKE SLOPE OVERLOOK CISTERN (600-82)

Roos (1990) reported two unfenced cisterns at this homestead location; one cistern measures 2.5 m (8 ft) in diameter and 4.3 m (14 ft) deep, and the other is 1 m (3.5 ft) across by 1.2 m (4 ft) deep. The site is on the Wahluke Slope northeast of the Hanford Townsite, southeast of the 100-F Area, and near the bluffs overlooking the Columbia River.

Lucas (1993) reported the condition of only one cistern, saying it had wood and wire debris. No samples were collected. Shannon & Wilson (1994b) field notes use the word "cistern" in the singular, but U.S. Army Corps of Engineer surveys of the area confirmed Roos (1990) and show two cisterns about 50 m (150 ft) apart (Chong 1996). Debris in the area was removed and at least one cistern was filled with 42 m³ (55 yd³) of gravel (Shannon & Wilson 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.29 WAHLUKE SLOPE STOCK TANK CISTERN (600-83)

Roos (1990) reported the stock tank cistern as approximately 3.7 by 3.7 by 1.2 m (12 by 12 by 4 ft) deep, with the top of the tank about 0.6 m (2 ft) above the ground surface. There were many metal cans in the area, as well as lumber used for fencing and corrals. No homestead structure was found. The site is located on the opposite side of the Columbia River, east-northeast of the 100-F Area near the electrical transmission lines. The cistern is located on a power line road that ends at the Wahluke Branch Wasteway. A large sand dune is at the east end of the road, and the cistern is at the southwest end of the sand dune. A cased well measuring 20 cm (8 in.) in diameter was located just north of the cistern.

Lucas (1992) saw about 2.5 cm (1 in.) of soil on the bottom with a few empty 1-quart oil cans, a D- Battery, beverage containers, chain, and wood. Based on the site inspection, no samples were collected. The cistern was backfilled with 19 m³ (25 yd³) of pit-run gravel. The debris and garbage around the site were left due to their cultural significance as artifacts from the Homestead era (Shannon & Wilson 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.30 WAHLUKE WAGON ROAD CISTERN (600-84)

The cistern is located on the Wahluke Slope, east of the 100-F Area and north-northeast of the Hanford Townsite on the opposite side of the Columbia River and measures 2.4 m (8 ft) in diameter and 2.4 m (8 ft) deep. Roos (1990) reported that little remained at the homestead, only some barrel hoops, wire, and a possible disposal or outhouse pit 27 m (90 ft) east of the cistern. An old wagon road runs through the area.

No discolored soil was found and no samples were collected (Lucas 1993). Debris, including glass bottles, tin cans, and random garbage, was removed from the site and disposed of properly. The cistern was backfilled with 7.6 m³ (10 yd³) of pit-run gravel (Shannon & Wilson 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.31 WAHLUKE SLOPE STOVE CISTERN (600-85)

This cistern is located on the Wahluke Slope, east of the 100-F Area and east-southeast of the 100-H Area. Roos (1990) and Lucas (1992, 1993) do not mention this site (using this name or obvious alias). No dimensions or site descriptions are given. Debris around the site was removed per Shannon & Wilson (1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.32 WAHLUKE SLOPE WASTEWAY CISTERN (600-86)

The cistern is located on the Wahluke Slope, northeast of the 100-H Area near the Wahluke Branch Canal and the White Bluffs Wasteway. This cistern measured 2.4 m (8 ft) in diameter and 0.9 m (3 ft) deep. Roos (1990) reported that the cistern was mostly destroyed and filled in.

The cistern has been backfilled with 25.2 m³ (33 yd³) of gravel. Debris on site, including tin cans, glass bottles, concrete, cable, and other assorted garbage, was removed (Shannon & Wilson 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.33 WAHLUKE SLOPE DUNE HOMESTEAD (600-87)

This homestead site contained buildings and a domestic trash disposal area. It is located on the Wahluke Slope east of the 100-F Area and northeast of the Hanford Townsite on the opposite side of the Columbia River. It is near a series of sand dunes.

Debris present at the site included domestic trash, parts of a barn or shed, parts of a flour mill, carriage pieces, and a harness. No cistern was observed (Roos 1990). The debris was removed and no additional environmental hazards were observed (Shannon & Wilson 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.34 WAHLUKE SLOPE LONETREE HOMESTEAD (600-88)

The site is located on the Wahluke Slope, east-northeast of the Hanford Townsite and southeast of the 100-F Area on the opposite side of the Columbia River. Roos (1990) reported that the site contains a single live cherry tree, several dead trees, and some small disposal areas. No aboveground structures remained.

Debris at the site, consisting of metal cans and broken glass, was removed (Shannon & Wilson 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.35 WAHLUKE SLOPE ASPHALT BATCH PLANT (600-89)

The site is a graveled area about 0.8 ha (2 acres) in size located on the Wahluke Slope. The site is north-northeast of the 100-D Area and south of Highway 24. It was apparently used as a temporary batch plant for mixing asphalt for paving operations. Two adjacent pits on site were empty. Another 4.6- by 4.6-m (15- by 15-ft) area was used for disposal of concrete. The original users of the area are unknown. The visual inspection did not reveal any environmental hazards (Roos 1990, DOE-RL 1994c). In 1994 the debris, including asphalt, concrete, sheet metal, and other garbage, was removed (Shannon & Wilson 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.36 WAHLUKE SLOPE COYOTE BAIT CAN/BAIT STATION (600-90)

This waste site is composed of two separate sites, the Coyote Bait Can site and the Coyote Bait Station site. The sites are both located southeast of the 100-F Area on the opposite side of the Columbia River.

The Coyote Bait Can site is located southeast of the 100-F Area and northeast of the Hanford Townsite. A large ammunition box was partially buried at this site. The lid of the box was marked "BAIT CAN." The Coyote Bait Station is located east of the Coyote Bait Can site, near the eastern edge of the wildlife area. At this site were the remains of more than 50 coyote skulls. Large animal bones in the area indicate that a poisoned animal carcass was the bait used most often at this site. Historical records report that trappers would poison horse carcasses to attract and kill the coyotes for their pelts. Many of the bones at this site are quite old and may predate government ownership of the land (Roos 1990). The bait can was removed (Shannon & Wilson 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.37 WAHLUKE SLOPE GRAVEL PIT #47 (600-91)

This site is composed of two apparently active gravel pits (DOE-RL 1994c). The pits are located on the Wahluke Slope northeast of the 100-B Area and 0.4 km (0.25 mi) south of Highway 24 at mile marker 47.

In 1993, an ERA investigation identified debris in the smaller pit and a significant amount of contaminated soil (DOE-RL 1994c). However, a few years earlier, Roos (1990) reported only a 1-quart oil can and no oil-contaminated soil in either pit. The debris, which included building materials, glass bottles, tin cans, paint cans, cable, concrete, oil cans, and other garbage, and the contaminated soil, was removed in 1993 and 1994 (Shannon & Wilson 1994a, 1994b). Samples taken during the excavation were analyzed at the site with a Hanby test kit. The contaminated sample showed 7,700 ppm motor oil; the clean soil in the bottom of the completed excavation showed 200 ppm. The Washington Department of Transportation removed the contaminated soil (Shannon & Wilson 1994a, 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.38 WAHLUKE SLOPE GRAVEL PIT #56, BORROW PIT #56 (600-92)

This site consists of several pits. The site is located on the Wahluke Slope north-northwest of the 100-D Area and north of Highway 24.

A visual inspection was performed as part of the ERA investigation (Roos 1990, DOE-RL 1994c). Debris removed from the site in 1994 included communications wire, timbers, bottles, cans, barbed wire, fence posts, a 19-L (5-gal) can full of dead insects, and two 19-L (5-gal) oil cans filled with liquid. No other environmental hazards were identified (Shannon & Wilson 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.39 HANFORD FIRING RANGE (600-93)

This site is located across the Columbia River from the Hanford Townsite. The original Hanford Security Forces used this firing range for target practice. At this site a bench has been cut out of the bluff measuring approximately 90 m (100 yd) long. A number of 208-L (55-gal) drums were placed at the base of the bluff along the bench to serve as targets. Numerous spent bullets were found around the target areas, and a burial trench located west of the site contained empty metal ammunition boxes.

Ordnance teams investigated the area but they found no unexploded ordnance. The U.S. Army Explosive Ordnance Division excavated a soil pile on the site, and a shallow excavation was made into the bullet impact zone. This excavation produced three 37-mm rounds. All three rounds were confirmed as nonexplosive solid rounds. There was no evidence to indicate that explosive rounds had even been fired at this site, based on the lack of impact craters, holes in the targets (they were not blown apart), and lack of shrapnel. A second, smaller site nearby had small pieces of bullets, but this "shrapnel" may have resulted from impact with a rock instead of an explosion (Roos 1990, DOE-RL 1994c). The only debris removed at this site was the 208-L (55-gal) metal drums and other metal debris (Shannon & Wilson 1994b).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.40 WAHLUKE SCHOOLHOUSE (600-94)

This site is an old schoolhouse located on the Wahluke Slope, but it is not part of the Wahluke Townsite. The schoolhouse is located north of the 100-B Area, near the north shore of the Columbia River.

Only the concrete front steps remain of the building. The rest of the structure has been removed. The steps were preserved because of a USGS survey marker that was imbedded in the top step (Roos 1990). A visual inspection did not identify any environmental hazards (DOE-RL 1994c).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.41 WAHLUKE SLOPE BRIDGE DISPOSAL AREA, BRIDGE OVERLOOK SITE, BRIDGE VIEW SITE (600-95)

This site consists of two separate areas, both of which were littered with old lumber, glass, and metallic debris. The site is located at the top of the hill north of Vernita Bridge, northwest of the 100-B/C Area. Roos (1990) reported that the site contained the remains of three or four wood frame structures, with roofing material, window screen, railroad ties, structural lumber, personal items such as toothbrushes and razors, and military oil cans.

Geophysical surveys were conducted at both areas at the site. In one of the sites, anomalies at four locations were indicative of metal debris buried within 1.5 m (5 ft) of the surface. No anomalies were found at the other area (CDM 1994). In 1994, cleanup crews removed the debris from the site and made two large piles of wood that were later burned by the USFWS (Shannon & Wilson 1994a, 1994b). The documents compiled in DOE-RL (1994a) appear to be inconsistent when referring to the "Bridge Overlook Site 1" and "Bridge Overlook Site 2." Also refer to the discussion in 600-18 for the debris cleanup at the Bridge Overlook sites. A background sample (B0C3C0, also known as 94B0V2-BG1-002) was taken at the site (CDM 1994). Appendix A, Table A-2 presents a summary of sampling results.

The site has been revegetated with native species. Vegetation monitoring results were published annually for 5 years after revegetation in the Environmental Restoration Contractor Revegetation Monitoring Report (see Johnson et al. [2000] for the last of the 5 years of monitoring).

No further action was required for this site following the ERA according to the ROD (EPA 1996). Because the final cleanup of this site was completed as a landlord action and did not require cleanup under CERCLA regulations, the EPA and Ecology requested that its WIDS designation be changed from "Deleted from the NPL" to "Rejected."

WIDS Status: Rejected.

3.42 USBR, USBR 2,4-D BURIAL SITE, USBR-2.4-D (600-104)

The 2,4-D disposal site is about 122 m (400 ft) long by 18.3 m (60 ft) wide (Lerch 1998). The burial site is located across the Columbia River from the 100-F Area. It is approximately 0.8 km (0.5 mi) east of the Columbia River and south of the old White Bluffs Townsite at the toe of an encroaching sand dune that stands about 18.3 m (60 ft) above grade of the waste site (Lerch 1998). This is the only known and documented hazardous waste disposal area north of the Columbia River (Valcich 1992).

In 1966, the U.S. Bureau of Reclamation (USBR) used this site to bury 46 m (50 yd) of soil contaminated with 3,407 L (900 gal) of 2,4-D that had leaked from storage tanks from a USBR station in Eltopia, Washington (Roos 1990). In 1967, the USBR flattened and buried a reported eleven 2,4-D storage tanks (3.7 m [12 ft] long with 1.2-m [4-ft] diameters) in the same excavation as the contaminated soil (Ecology and DOE-RL 1997). The site has not been used since 1967, but the specific location of the burial trench and the dates the items were disposed on are not documented (Ecology and DOE-RL 1997). The half-life of 2,4-D in the soil under dry conditions is usually between 9.4 and 254 days with the average typical half-life under normal application conditions being about 10 days (Cramer 1985, DOE-RL 1994c).

Lucas (1993) took samples from eight evenly spaced auger-rig borehole locations at the site in February 1993. Locations 1, 2, 3, and 4 showed less than detection limit results for field analysis of 2,4-D, so these samples were composited into sample number B07KQ6. Locations 5, 6, and 7, also less than the detection limit for field analysis, were composited into sample B07KQ7. Sample B07KQ5 was taken from location 8, which showed a positive (but near detection limit) field analysis result for 2,4-D (Lucas 1993). The laboratory samples showed no detectable levels of 2,4-D (DOE-RL 1994c; Shannon & Wilson 1994c; Appendix A, Table A-2 presents a summary of sample results).

Based on the 1993 sampling results and expected life span of the 2,4-D in the environment, only verification sampling (characterization) and hazard mitigation (if justified) was required for the site (Ecology and EPA 1994, DOE-RL 1994c, Ecology and DOE-RL 1997). In February and March 1994, geophysical surveys were conducted at the site to more precisely locate the buried tanks so angle borings could be drilled close to the edges of the tanks (Shannon & Wilson 1994c) for the verification sampling. In July 1994, the U.S. Army Corps of Engineers drilled four exploratory holes at an incline under the buried tanks. Four samples were collected per borehole, plus two duplicate samples and one split provided to Ecology for a total of 19 samples. No 2,4-D or breakdown products were detected. The samples were analyzed for chlorinated

herbicides with a method detection limit for 2,4-D of 0.2 ppm (Shannon & Wilson 1994c, Ecology and DOE-RL 1997).

In 1997, a hunter reported to the Fish and Wildlife Commission that he had seen the weathered, 2,4-D Burial Site warning signs and he believed there was still contamination at the site (Ecology and DOE-RL 1997). The EPA toured and investigated the site on May 3, 1997 with the hunter and conducted cursory sampling by digging four small pits that were 0.9 m (3 ft) in diameter and 0.6 m (2 ft) deep at locations that showed stressed vegetation. These pits were located 1.5 to 3 m (5 to 10 ft) from the base of the sand dune and at random locations 6.1 to 61 m (20 to 200 ft) north of the buried tanks. During the investigation, strong chemical odors were encountered (Ecology and DOE-RL 1997).

Four samples were collected, one of which had a detectable level of 2,4-D higher than the cleanup standard of 800 ppm. This "hot spot" had 2,4-D concentrations of 2,500 ppm (Ecology and DOE-RL 1997). The "hot spot" was estimated as 7.6 m long by 4.6 m wide by 1.5 m deep (25 ft long by 15 ft wide by 5 ft deep) (Lerch 1998). The results of this "hot spot" sample resulted in EPA approving a sampling plan in May 1997 that would further characterize the contamination at this spot (Ecology and DOE-RL 1997).

The characterization sampling data showed 2,4-D as high as 17,000 ppm and approximately 15 m³ (20 yd³) of contaminated soil that were above the cleanup standards. In addition, the 2,4-D sample contained dioxin levels that exceeded the MTCA standards of 0.00000667 ppm. The contamination ranged from 0.6 to 2.4 m (2 to 8 ft) deep in the soil. Additional hand auger samples to depths of 1.5 m (5 ft) taken by EPA indicated further 2,4-D levels ranging from 1,000 to 1,300 ppm (Ecology and DOE-RL 1997).

Contamination was considered to potentially go 3 m (10 ft) deep and all across the area, based on the sampling data. There is no impact on the groundwater in the area as the groundwater is over 90 m (300 ft) below the surface of the site and, hence, is not contaminated or impacted by the 2,4-D at this location (Ecology and DOE-RL 1997).

The site was reopened and remediated under a CERCLA Action Memorandum issued in 1997 (Ecology and DOE-RL 1997). In August and September 1997, the bioremediation efforts were under way at this site. Excavated soil was placed on a plastic liner 30 mm thick, and composted manure was tilled into the soil and irrigated regularly (Lerch 1998). Random samples were periodically collected until the results fell within the allowable limits for 2,4-D, which marked the end of the bioremediation process for this waste site (Lerch 1998). The 2,4-D and dioxin-contaminated soil from the "hot spot" identified in May 1997 was excavated and shipped as U240-listed waste to the Laidlaw, Deer Park Treatment, Storage, and Disposal Facility in Texas. About 25 m³ (80 yd³) of contaminated material was shipped to Texas. Ten crushed tanks were found and removed as well (an eleventh tank was not found). They were shipped as U240-listed waste to the Laidlaw, Grassy Mountain Treatment, Storage, and Disposal Facility in Utah (Lerch 1998). As reported in Lerch (1998, sample numbers, cleanup criteria, and results on pages A-1 and A-2), five confirmation samples were collected from the excavated tank pit, 20 from the excavated trench, and 11 from the bioremediation area. All results were below the cleanup criteria.

Following these remediation activities, the appropriate Native American tribes were notified, and the site was revegetated with native seed in accordance with *Revegetation Manual for the Environmental Restoration Contractor* (BHI 1997) (Lerch 1998). Vegetation monitoring results are published annually for 5 years after revegetation in the *Environmental Restoration Contractor Revegetation Monitoring Report* (e.g., Johnson 2001 for the results of the fourth year's monitoring). The access road was recontoured and a berm was created to discourage further access (Lerch 1998). All the objectives established in the 1997 Action Memorandum were met as stated in the closure document *100-IU-3 Waste Site 600-104 Remediation Summary* (Lerch 1998).

WIDS Status: Deleted from the NPL.

3.43 REMAINS OF WINDMILL, RCRA GENERAL INSPECTION HIRIV-FY96 ITEM #6 (600-154)

On September 9-10, 1996, an inspection of the banks of the Columbia River within Hanford Site boundaries was performed in accordance with the Hanford Facility RCRA Permit, Condition II.0.1.c. This site was identified at the time of the inspection. This waste site contains the remains of an old windmill (DOE-RL 2002). The site is located due north of the 100-D Area and about 50 m (165 ft) north of the left bank (facing downstream) of the Columbia River. The only paved road from Highway SR24 that heads towards the river goes to this site.

The windmill was constructed of sheet metal and steel. An abandoned well was observed about 90 m (295 ft) southwest of the windmill. EPA, DOE, DOE-RL, and Ecology visited the site on January 28, 1998, and all parties agreed this site would not be designated as a waste site. The site is located in a culturally and biologically sensitive area.

The site was rejected as a potential WIDS waste site (DOE-RL 2002).

WIDS Status: Rejected.

3.44 RCRA GENERAL INSPECTION 200WFY97 ITEM #21 HISTORIC DISPOSAL SITE, DUMPING AREA NEAR WHITE BLUFFS FERRY LANDING (EAST SIDE) (600-229)

This site contains several empty, rusted 19-L (5-gal) steel containers that are partially buried or filled with soil. The site is located about 250 m (820 ft) downstream from the old White Bluffs Ferry Landing on the east side of the Columbia River and just above the high water mark.

The Bonneville Power Administration power lines cross the river approximately 25 m (82 ft) south of the site. The containers appeared to have been used for fuel. EPA, Ecology, DOE, and DOE-RL visited the site on January 26, 1998 and agreed that DOE-RL would remove all the drums in accordance with applicable regulations and BHI procedures. This site has been rejected as a potential waste site from WIDS (DOE-RL 2002).

WIDS Status: Rejected.

4.0 REFERENCES

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APPENDIX A
SUMMARY OF SAMPLING RESULTS

Table A-1. Sampling Summary From Sites in the 100-IU-1 Operable Unit. (2 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (From ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
600-41	600-41, H 70 Anti-Aircraft Artillery (AAA) Site	No samples collected						
600-42	600-42, H 71 Anti-Aircraft Artillery (AAA) Site	No samples collected						
600-43	600-43, McGee Fish Farm	No samples collected						
600-44	600-44, Herbicide/ Pesticide Empty Container Pile, Enyert Well Empty Pesticide Container Dump, 600-68	8 samples total, 5 confirmatory (including one background)	Aldrin (ppm)	U	0.0588	27	0.00045 J (laboratory result), >2 (field screening instrument)	27 – 55-gal drums
			Dieldrin (ppm)	0.0012	0.0625	38	0.0036	
			4,4'-DDE (ppm)	0.0067	Not a COC	57	0.0007 (estimated)	
600-45	600-45, Transite and Metal Debris Pile	No samples collected						
600-101	600-101, RRCWP, Riverland Railroad Car Wash Pit	60 samples total; 5 confirmatory	Diesel (ppm)	None	200	1,800	<2	
			Heavy oil (ppm)	None	200	2,210	<2	
			Cobalt-60 (pCi/g)		Not a COC	0.382	U	
			Cesium-137 (pCi/g)		Not a COC	19.6	U	
			Europium-152 (pCi/g)		Not a COC	1.91	U	

Table A-1. Sampling Summary From Sites in the 100-IU-1 Operable Unit. (2 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (From ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
600-102	600-102, 600 AMBS, 600 Area Army Munitions Burial Site	2 confirmatory samples	Nitrates, nitrites (ppm)				32.9	None (remediated in 1986)
600-140	600-140, Gunny Sacks South of H-70 Antiaircraft Site	No samples collected						
600-141	600-141, Barrels South of H-70 Antiaircraft Site	No samples collected						
600-142	600-142, Car Body at McGee Ranch Fish Farm	No samples collected						
600-143	600-143, Car Body at Ford Well	No samples collected						
600-144	600-144, Car Body Near Top of Umptanum Ridge	No samples collected						
600-273	600-273, Pile of Red Material at Riverlands	No samples collected						
600-274	600-274, 2,4-D Can Site at McGee Ranch, Riverland	4 pre-removal samples, 16 confirmatory, 2 background	2,4-D (ppm)	0.25	800	86,000	27	1 – 55-gal drum of cans and soil

^aAverage soil background values from background samples taken near each site.^bMaximum concentrations.

J = Estimated value.

U= Compound was analyzed for but not detected.

Table A-2. Sampling Summary from Sites in the 100-IU-3 Operable Unit. (13 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (from ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
600-6	600-6, MIL – H-12-L, Battery B Nike Missile Launch Site	1993: 2 from acid pit; 1994: 1 background	Arsenic (ppm)	3.3	20	2.3		None; debris removed
			Chromium (ppm)	8.1	100	11.4		
			Lead (ppm)	6.3	250	4.7 NS		
			Petroleum hydrocarbons (ppm)	U	200	Not analyzed		
			Heavy oils (ppm)	U	200	Not analyzed		
		1998: 6 biota samples	DDD-4,4' (ppm)	U		U		
			DDE-4,4' (ppm)	0.18		0.07 (beetle)		
			DDT-4,4' (ppm)	0.03		U		
600-7	600-7, Nike Asbestos Pipe Site, Concrete/ Asbestos Pipe Site	None						None; debris removed
600-8	600-8, MIL – H-06C, Control Center for Battery A Nike Missile, Wahluke Slope Nike Missile Base, WSNMB, 600-103 (Part)	None						None
600-9	600-9, MIL – H-06L, Battery A Nike Missile Installation Launch Site, Wahluke Slope Nike Missile Base, WSNMB, 600-103 (Part)	1993: 1 from drywell (B07KQ2); 1 from rock pit (B07KQ3); 1994: 44 soil and 6 aqueous (pesticide) from landfills; 4 background	Arsenic (ppm)	3.3	20	41.6	8.81	8,000 yd ³ excavated/the amount removed is not reported

Table A-2. Sampling Summary from Sites in the 100-IU-3 Operable Unit. (13 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (from ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
			Chromium (ppm)	8.1	100	56.4	21.3	
			Lead (ppm)	6.3	250	217	27.2	
			DDD-4,4' (ppm)	0.008	4.17	786	0.597	
			DDE-4,4' (ppm)	0.0017	2.94	44.4	1.66	
			DDT-4,4' (ppm)	0.0053	1	2,080	0.806	
			Petroleum hydrocarbons (ppm)	U	200	165,000	U	
			Heavy oils (ppm)	U	200	Not reported	U	
			Methylene chloride (ppb)		Not a COC	7.1	U	
			Xylene (total) (ppb)		Not a COC	220	U	
			PCBs (ppb)		Not a COC	344	U	
			Endosulfan-B (ppb)		Not a COC	4.52	U	
			Methoxychlor (ppb)		Not a COC	1.92	U	
			Chlordane (ppb)		Not a COC	37,700	U	
			Dieldrin (ppb)		Not a COC	2,630	U	
			Acenaphthene (ppb)		Not a COC	9,700	U	
			Anthracene (ppb)		Not a COC	14,000	U	

Table A-2. Sampling Summary from Sites in the 100-IU-3 Operable Unit. (13 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (from ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
			Benzo(A)-anthracene (ppb)		Not a COC	8,300	U	
			Benzo(B)-fluoranthene (ppb)		Not a COC	6,800	U	
			Benzo(K)-fluoranthene (ppb)		Not a COC	2,300	U	
			Benzo(A)-pyrene (ppb)		Not a COC	5,300	U	
			Bis(2-ethylhexyl)-phthalate (ppb)		Not a COC	1,400	U	
			Chrysene (ppb)		Not a COC	8,600	U	
			Dibenzofuran (ppb)		Not a COC	8,500	U	
			Di-N-butyl phthalate (ppb)		Not a COC	530	U	
			Di-N-octyl-phthalate (ppb)		Not a COC	1,600	U	
			Fluoranthene (ppb)		Not a COC	24,000	U	
			Fluorene (ppb)		Not a COC	14,000	U	
			2-Methyl-naphthalene (ppb)		Not a COC	12,000	U	
			Naphthalene (ppb)		Not a COC	8,000	U	

Table A-2. Sampling Summary from Sites in the 100-IU-3 Operable Unit. (13 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (from ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
			Phenanthrene (ppb)		Not a COC	57,000	U	
			Pyrene (ppb)		Not a COC	18,000	U	
			Aldrin (ppb)		Not a COC	55	U	
		Biota: 1998, 7 samples; 1999, 14 samples	DDD-4,4' (ppb)	U			1.7 J (mouse)	
			DDE-4,4' (ppb)	0.18			1.64 (mouse)	
			DDT-4,4' (ppb)	0.03			1.7 (mouse)	
600-10	600-10, MIL – H-12C, Battery B Nike Missile Control Center	None						Only surface debris removed
600-11	600-11, MIL – H-81R	1992: 1 sample (B07KQ1) from drywell; 1994: 3 from soil (2 for TPH only, 1 for pesticide)	Arsenic (ppm)	3.3	20	1.9		The amounts of soil and surface debris removed is not reported
			Chromium (ppm)	8.1	100	10.4		
			Lead (ppm)	6.3	250	48.4		
			DDD-4,4' (ppm)	0.008	4.17	U		
			DDE-4,4' (ppm)	0.0017	2.94	0.041		
			DDT-4,4' (ppm)	0.0053	1	U		
			Endrin aldehyde			0.0022		
			Petroleum hydro- carbons (ppm)	U	200	14,000 – 42,300		

Table A-2. Sampling Summary from Sites in the 100-IU-3 Operable Unit. (13 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (from ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
		1998: 2 biota samples	Heavy oils (ppm)	U	200			
			DDD-4,4' (ppm)	U			U	
			DDE-4,4' (ppm)	0.18			0.11 (beetle)	
			DDT-4,4' (ppm)	0.03			0.01 (beetle)	
600-12	600-12, MIL – H-83C, Battery C Control Center	1994: 2 background samples; 1998: 8 biota samples	DDD-4,4' (ppm)	U			U	Building debris excavated, none removed
			DDE-4,4' (ppm)	0.18			0.26 (starling egg)	
			DDT-4,4' (ppm)	0.03			0.12 (raven egg)	
600-13	600-13, MIL – H-83L, Battery “C” Launch Site, PSN 80	1992: 6 samples; 1994: 8 samples (landfills); 1 background	Arsenic (ppm)	3.3	20	4.7	1.16	2 yd ³ oily soil; surface debris removed
			Chromium (ppm)	8.1	100	14	5.16	
			Lead (ppm)	6.3	250	11.6	Not reported	
			DDD-4,4' (ppm)	0.008	4.17	0.0024	Not reported	
			DDE-4,4' (ppm)	0.0017	2.94	0.15	Not reported	
			DDT-4,4' (ppm)	0.0053	1	0.22	Not reported	
			Petroleum hydrocarbons (ppm)	U	200	168,000	U	
			Heavy oils (ppm)	U	200	11,400	U	

Table A-2. Sampling Summary from Sites in the 100-IU-3 Operable Unit. (13 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (from ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
		1998: 7 biota samples	DDD-4,4' (ppm)	U			U	
			DDE-4,4' (ppm)	0.18			0.87 (magpie egg)	
			DDT-4,4' (ppm)	0.03			U	
600-14	600-14, MIL – PSN 01	1998: 8 biota samples; 1999: 1 biota	DDD-4,4' (ppm)	U			U	Surface debris removed
			DDE-4,4' (ppm)	0.18			0.66 (magpie egg)	
			DDT-4,4' (ppm)	0.03			0.02 (beetle)	
600-15	600-15, MIL – PSN 04	1992: 8 pre-RA samples. 1994: 1 sample of drum sludge, 2 confirmatory samples, 1 background, 1 blank	Arsenic (ppm)	3.3	20	6.8	9.24	107 yd ³ excavated/the amount removed is not reported
			Chromium (ppm)	8.1	100	17	10.7	
			Lead (ppm)	6.3	250	18.9*	U	
			DDD-4,4' (ppm)	0.008	4.17	0.0015 JP	U	
			DDE-4,4' (ppm)	0.0017	2.94	0.14	0.0038	
			DDT-4,4' (ppm)	0.0053	1	0.065	0.00363	
			Petroleum hydrocarbons (ppm)	U	200	50	U	
			Heavy oils (ppm)	U	200	Not analyzed	U	

Table A-2. Sampling Summary from Sites in the 100-IU-3 Operable Unit. (13 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (from ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
		1998: 7 biota samples	DDD-4,4' (ppm)	U			U	
			DDE-4,4' (ppm)	0.18			0.68 (raven egg)	
			DDT-4,4' (ppm)	0.03			0.028 (kingbird egg)	
600-16	600-16, MIL – PSN 07/10, PSN 10, H-07-H, Base Camp 500	1993: 3 pre-RA samples	Arsenic (ppm)	3.3	20	6		Surface debris removal only
			Chromium (ppm)	8.1	100	18.4		
			Lead (ppm)	6.3	250	21.3		
			DDD-4,4' (ppm)	0.008	4.17	0.0012 P		
			DDE-4,4' (ppm)	0.0017	2.94	0.00055 JP		
			DDT-4,4' (ppm)	0.0053	1	3.2 JP		
			Petroleum hydrocarbons (ppm)	U	200	72		
			Heavy oils (ppm)	U	200	Not analyzed		
		1998: 11 biota samples	DDD-4,4' (ppm)	U			U	
			DDE-4,4' (ppm)	0.18			9.6 (killdeer egg)	
			DDT-4,4' (ppm)	0.03			0.22 (killdeer egg)	
			Dieldrin (ppm)	U			4.4 (killdeer egg)	

Table A-2. Sampling Summary from Sites in the 100-IU-3 Operable Unit. (13 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (from ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
600-17	600-17, MIL – PSN 12/ 14 Site and Military Dump, Tent Camp 505, PSN 12, H-14	1994: 1 composite sample of oily soil associated with cans in two anomalies, 1 background sample	Arsenic (ppm)	3.3	20	1.88		~4,000 yd ³ excavated; the quantity removed is not reported
			Chromium (ppm)	8.1	100	9.72		
			Lead (ppm)	6.3	250	11.8		
			DDD-4,4' (ppm)	0.008	4.17	U		
			DDE-4,4' (ppm)	0.0017	2.94	0.0213		
			DDT-4,4' (ppm)	0.0053	1	0.00637		
			Endrin (ppm)	U		0.194		
			Petroleum hydrocarbons (ppm)	U	200	68,500		
			Heavy oils (ppm)		200	35,100		
		1998: 12 biota samples	DDD-4,4' (ppm)	U			U	
			DDE-4,4' (ppm)	0.18			4.0 (magpie egg)	
			DDT-4,4' (ppm)	0.03			0.029 (magpie egg)	
600-18	600-18, MIL – PSN 72/ 82, PSN 72, H-82, Bridge Overlook 2 Site, Tent Camp 515	1994: 1 background sample; 1998: 5 biota samples	DDD-4,4' (ppm)	U			U	120 yd ³ excavated; the amount removed is not reported
			DDE-4,4' (ppm)	0.18			0.06 (beetle)	
			DDT-4,4' (ppm)	0.03			U	

Table A-2. Sampling Summary from Sites in the 100-IU-3 Operable Unit. (13 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (from ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
600-19	600-19, MIL – PSN 90, H-90, Base Camp 410	1992: 4 waste samples; 1994: 1 waste, 1 confirmatory, and 1 background sample	Arsenic (ppm)	3.3	20	690	4.52	
			Chromium (ppm)	8.1	100	14	7.99	
			Lead (ppm)	6.3	250	1,200	Not reported	
			DDD-4,4' (ppm)	0.008	4.17	0.041	Not reported	
			DDE-4,4' (ppm)	0.0017	2.94	0.0803	Not reported	
			DDT-4,4' (ppm)	0.0053	1	0.49	Not reported	
			Petroleum hydro- carbons (ppm)	U	200	65,000	Not reported	
			Heavy oils (ppm)	U	200	Not analyzed	Not reported	
		1999: 9 biota samples	DDD-4,4' (ppm)	U			U	
			DDE-4,4' (ppm)	0.18			0.70 (beetle)	
			DDT-4,4' (ppm)	0.03			0.03 (beetle)	
600-72	600-72, Wahluke Slope H-12-R Debris Site, H-12R	No samples collected						Only surface debris removed
600-73	600-73, Wahluke Slope Igloo Sites	1994: 1 background sample						Only surface debris removed
600-74	600-74, Wahluke Slope PSN 12/14 Military Construction Dump, Motor Pool Dump	No samples collected						Only surface debris removed

Table A-2. Sampling Summary from Sites in the 100-IU-3 Operable Unit. (13 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (from ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
600-75	600-75, Wahluke Slope PSN 80 Debris Site	No samples collected						Five 55-gal drums of soil, and surface debris removed
600-76	600-76, Wahluke Slope Radar Site, Underground Rooms	No samples collected						No removal actions recorded
600-77	600-77, Wahluke Slope Shrapnel Sites, Antiaircraft Gun Shrapnel Sites 1, 2, 3	No samples collected						No removal actions recorded
600-78	600-78, Power Pole 12-3 Cistern, 12-3 Cistern	No samples collected						No removal actions recorded
600-79	600-79, Wahluke Slope Clay Pit Cistern	One sample taken (93-CPC-S1-S0)	PCBs/pesticides				U	Surface debris removed
600-80	600-80, Wahluke Slope Cow Camp Cistern	One sample taken (93-CC-S2-S0)	PCBs/pesticides				U	Surface debris removed
600-81	600-81, Wahluke Slope Homestead Cistern	One sample taken (B07KQ4)	Arsenic (ppm)	3.3	20	3.4 NS		No removal actions; culturally sensitive
			Chromium (ppm)	8.1	100	16.8 N		
			Lead (ppm)	6.3	250	216		
			DDD-4,4' (ppm)	0.008	4.17	U		
			DDE-4,4' (ppm)	0.0017	2.94	U		
			DDT-4,4' (ppm)	0.0053	1	0.0045		

Table A-2. Sampling Summary from Sites in the 100-IU-3 Operable Unit. (13 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (from ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
			Petroleum hydrocarbons (ppm)	U	200	U		
			Heavy oils (ppm)	U	200	Not analyzed		
600-82	600-82, Wahluke Slope Overlook Cistern	No samples collected						Surface debris removed
600-83	600-83, Wahluke Slope Stock Tank Cistern	No samples collected						No removal actions; culturally sensitive
600-84	600-84, Wahluke Slope Wagon Road Cistern	No samples collected						Surface debris removed
600-85	600-85, Wahluke Slope Stove Cistern	No samples collected						Surface debris removed
600-86	600-86, Wahluke Slope Wasteway Cistern	No samples collected						Surface debris removed
600-87	600-87, Wahluke Slope Dune Homestead	No samples collected						Surface debris removed
600-88	600-88, Wahluke Slope Lonetree Homestead	No samples collected						Surface debris removed
600-89	600-89, Wahluke Slope Asphalt Batch Plant	No samples collected						Surface debris removed
600-90	600-90, Wahluke Slope Coyote Bait Can/Bait Station	No samples collected						Surface debris removed

Table A-2. Sampling Summary from Sites in the 100-IU-3 Operable Unit. (13 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (from ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
600-91	600-91, Wahluke Slope Gravel Pit #47	Four field screening samples	Motor oil (ppm)			7,700	200	Debris and contaminated soil removed
600-92	600-92, Wahluke Slope Gravel Pit #56, Borrow Pit #56	No samples collected						Surface debris removed
600-93	600-93, Hanford Firing Range	No samples collected						Surface debris removed
600-94	600-94, Wahluke Schoolhouse	No samples collected						No debris
600-95	600-95, Wahluke Slope Bridge Disposal Area, Bridge Overlook Site	See 600-18						See 600-18
600-104	600-104, USBR, USBR 2,4-D Burial Site, USBR-2,4-D	36 confirmation samples	2,4-D (ppm)		800	17,000	460	94 yd ³ soil and 4.4 tons of tanks removed
			2,4,5-T (ppm)		800		1.5	
			Dioxin (ppt, or pg/g)		6.7	>6.7	6.1	
			2,3,7,8-TCDD (ppt, or pg/g)		6.7	>6.8	2.3	
600-154	600-154, Remains of Windmill, RCRA General Inspection HIRIV-FY96 Item #6	No samples collected						No debris

Table A-2. Sampling Summary from Sites in the 100-IU-3 Operable Unit. (13 Pages)

WIDS Number	WIDS Site Names	Samples Taken (Number/Type)	COCs/ Other Hits	Average Soil Background ^a	Cleanup Level (from ROD)	Pre-RA Concentration ^b	Confirmatory Sample Concentration ^b	Volume of Soil Excavated/ Removed
600-229	600-229, RCRA General Inspection 200WFY97 Item #21 Historic Disposal Site, Dumping Area Near White Bluffs Ferry Landing (East Side)	No samples collected						Surface debris removed

^aAverage soil background values from ROD (except for lead) taken from DOE-RL (2001) (DOE/RL-92-42, Rev. 4), and for biota samples background taken from Roy et al. (1998).

^bMaximum concentrations.

* = Duplicate analysis not within control limits of 20% or \pm contract-required detection limit.

J = Estimated value.

N = Spiked sample recovery not within control limits of 75% to 125%.

P = Used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns.

S = The reported value was determined by the Method of Standard Additions.

U = Compound was analyzed for but not detected.

Appendix A – Summary of Sampling Results

APPENDIX B

**RIVERLANDS AND NORTH SLOPE ACTIVITY AND
DOCUMENT CHRONOLOGY**

APPENDIX B

RIVERLANDS AND NORTH SLOPE ACTIVITY AND DOCUMENT CHRONOLOGY

Pre-Hanford Years

Homesteads & Native American use

1950 to 1956

Two anti-aircraft batteries constructed on Riverlands

1964

End of Military base use.

1974

U.S. Army, 1974, Demolished/removed structures at military sites.

April 1992

Valcich, P. J., 1992, *100-IU-1 Operable Unit Expedited Response Proposal*,
WHC-SD-EN-PD-009, Westinghouse Hanford Company, Richland, Washington.

October 28, 1992 to August 9, 1993

Heiden, C. E., 1992, *Riverland Expedited Response Action (ERA) 100-IU-1*, EFL-1042, Logbook
(1st of three). Recorded daily characterization, sample collection, and cleanup activities.

April 1993

DOE-RL, 1993, *Riverland Expedited Response Action Proposal*, DOE/RL-93-01,
U.S. Department of Energy, Richland, Washington. Summarized previous
characterization, including sample results.

June 1993

Smith, R. F., (EPA) and R. Stanley (Ecology), 1993, *Action Memorandum: Expedited Response
Action Proposal; Riverland Site, U.S. Department of Energy Hanford Site, Richland,
Washington*, U.S. Environmental Protection Agency and Washington State Department of
Ecology.

August 20, 1993

Heiden, C. E. 1993, *Riverland ERA Cleanup Sampling and Analysis Plan*, WHC-SD-EN-AP-138, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

August 26, 1993 to October 26, 1993

Heiden, C. E. 1993. *Riverland Expedited Response Action (ERA) 100-IU-1*, EFL-1042-2, Logbook (2nd of three). Recorded daily characterization, sample collection, and cleanup activities.

October 1993

Diesel contaminated soil paced at 190-C concrete pad for bioremediation (reference Heiden 1994).

May 23, 1994 to September 26, 1994

Heiden, C. E. 1994. *Riverland Expedited Response Action (ERA) 100-IU-1*, EFL-1042-3, Logbook (3rd of three). Recorded daily characterization, sample collection, and cleanup activities.

June 1995

DOE-RL, 1995, *Proposed Plan for the 100-IU-1, 100-IU-3, 100-IU-4, and 100-IU-5 Operable Units*, DOE/RL-95-60, Department of Energy, Richland, Washington. Summarized all previous work and identified preferred alternative for final remediation of waste sites as the step before the Record of Decision.

DOE-RL 1995, *Riverland Expedited Response Action Assessment*, DOE/RL-94-30, U.S. Department of Energy, Richland, Washington. Summarized cleanup actions performed at 100-IU-1.

March 1996

Ecology, EPA, and DOE, 1996, *Declaration of the Record of Decision, 100-IU-1, 100-IU-3, 100-IU-4, and 100-IU-5 Operable Units*, CCN 028346. Declared that the operable units met the cleanup criteria and that no further action was required.

March 22, 1996

Goldberg, G. I., 1996, Letter to S. M. Alexander, Washington State Department of Ecology, and D. R. Sherwood, U.S. Environmental Protection Agency, *Report on Diesel-Contaminated Soil from the 100-IU-1 Operable Unit (Riverland Railyard)*, 0043410, 028814, 028339, U.S. Department of Energy, Richland, Washington. Presented sampling results to show that bioremediated soil from Riverland Railyards met MTCA cleanup levels.

August 28, 1996

Faulk, D., 1996, *100-IU-1 Soil Remediation*, Letter to G. I. Goldberg, U.S. Department of Energy, 0045025, U.S. Environmental Protection Agency, Richland, Washington. Concurs with the DOE assessment that bioremediated soil meets MTCA cleanup levels.

May 22, 1998 to June 20, 1998

EPA, 1998, *Superfund Focus Sheet. Proposal for Partial Deletion from NPL of 100-IU-1 and 100-IU-3 Operable Units*. One-page public announcement of the intent to delete these two OUs from the National Priorities List.

July 8, 1998

63 FR 36861, *Federal Register*, Vol. 63, No. 130, Wednesday, July 8, 1998, "Notice of Partial Deletion of the Hanford 100-Area (USDOE) Superfund Site from the National Priorities List," United States Environmental Protection Agency, Washington, DC. Formal notice of deletion from the NPL for these operable units.

March 1999

Audet, D., T. Davidson, and R. Roy, 1999, Pre-Acquisition Survey Addendum, Identified Concerns at the U.S. Department of Energy Hanford Site, Arid Lands Ecology Reserve (ALE) and North Slope, U.S. Fish and Wildlife Service, Spokane, Washington.

March 24, 2000

Davidson, T., 2000, Environmental Site Assessment, Level 1 Contaminants Survey, Pre-Acquisition of the McGee Ranch and Riverlands Unit, Unpublished Report, U.S. Fish and Wildlife service, Spokane, Washington.

May 3, 2001

Hughes, G. M., 2001, Letter to Keith Klein, U.S. Department of Energy, identifying McGee Ranch, Riverlands, Columbia River Islands, ALE Reserve, and North Slope sites that require additional information as part of the pre-acquisition surveys, FWS-01-074, U.S. Fish and Wildlife Service, Richland, Washington.

NORTH SLOPE ACTIVITY AND DOCUMENT CHRONOLOGY

Pre-Hanford years

Homesteads & Native American use.

1950 to 1956

Ten anti-aircraft batteries constructed on North Slope.

1957 to 1958

Three Nike Missile locations began, anti-aircraft batteries phased out.

1964

End of Military base use; but land still used for maneuvers.

1966, 1967

Bureau of Reclamation used North Slope as a place to dispose of 2,4-D contaminated soil and crushed storage tanks.

1974

U.S. Army, 1974, Demolished/removed structures at military sites on North Slope.

1975

Portions of North Slope opened for public use and grazing allotments.

1989

U.S. Army, Yakima Firing Center removal of practice anti-tank mines, no document, cited on page 16 of DOE-RL (1994, DOE/RL-93-47, Rev. 0).

December 1989 through April 1990

Roos, R. C. (1990), *North Slope Investigation Report*, WHC-EP-0359, Rev 1. Review of historical records, interviews, aerial search, and ground search of North Slope to locate potential waste sites.

March 11, 1992

Gustafson, F. W. (1992), *North Slope Expedited Response Action Proposal*, WHC-SD-EN-PD-007. Background of the North Slope and initial proposal to conduct an Expedited Response Action (ERA).

May 29, 1992 to February 10, 1993

Lucas, J. G., 1992, *North Slope – ERA*, EFL-1031 (Logbook). Characterization of waste sites: visual evaluation, boreholes & sample collection information

July 27, 1992 through August 4, 1992

Gustafson, F. W., 1992, *Geophysical Surveys of Military Landfills Located on Hanford's Wahluke (North) Slope*, WHC-SD-EN-ER-001, Rev. 0. Geophysical surveys of PSN-04, H-06-H, and H-83-L.

October 6, 1992

Gustafson, F. W., 1992, *North Slope Expedited Response Action Field Sampling Plan*, WHC-SD-EN-AP-009, Rev. 0. Described the tasks associated with characterization of the military landfills on the North Slope to determine if remedial actions are required.

February 11, 1993 to May 11, 1993

Lucas, J. G., 1993, *North Slope – ERA* EFL-1031-2 (Logbook). Characterization of waste sites: visual evaluation, boreholes & sample collection information

November 16, 1993 to August 16, 1994

DOE-RL, 1995, *Ordnance and Explosive Waste Records Search Report*, DOE/RL-94-07, Rev. 0. Report of U.S. Army site visits, record searches, and interviews on ordnance use/explosive materials waste at Hanford Site batteries.

Unknown activity dates, unknown 'printing' date.

AEC, Unknown year (assumed to be compiled in 1993 based on August 1, 1993 revision date for Section 1), *Air Defenses of Hanford*, Camp Hanford: The Forward Positions, 1950-1964. A compilation of unreferenced, partial descriptions of each military location at Hanford, plus several summaries of the history of anti-aircraft sites, Nike missile program, and environmental impacts from such bases at other parts of the country.

February 1994

DOE-RL, 1994, *North Slope (Wahluke Slope) Expedited Response Action Cleanup Plan*, DOE/RL-93-47, Rev. 0. Contained previous characterization sample results and evaluated potential remediation alternatives for 39 sites.

March 17, 1994

Ecology and EPA, 1994, *Action Memorandum: North Slope (Wahluke Slope) Expedited Response Action Cleanup Plan*, CCN 0038537, U.S. Department of Energy Hanford Site, Richland, Washington. Approval of the removal action outlined in the ERA cleanup plan (DOE/RL-93-47).

1994

DOE-RL, 1994, *A Compendium of Field Reports for the North Slope (Wahluke Slope) Expedited Response Action, Hanford, Washington*, DOE/RL-94-139, Draft A. A collection of individual documents prepared by various subcontractors to the U.S. Army Corps of Engineers. Each reports on a different aspect of the North Slope cleanup or previous investigations; none of the reports integrated all the data. Contains the reports:

CDM, October 21, 1994, *Landfill Characterization and Remediation, Hanford North Slope, Washington*, CDM Federal Programs Corporation, Richland, Washington.

Smith, R. W. and M. J. Rhoades, July 26, 1994, *Results of Geophysical Survey H06-L Landfill, Hanford North Slope, Richland, Washington*, Harding Lawson Associates, Novato, California.

Shannon & Wilson, Inc., January 1994, *Interim Report, Expedited Response Action, Phase 1, Field Activities, Hanford North Slope*, V-0201-01, Shannon & Wilson, Inc, Kennewick, Washington. Summarizes debris removal, well structures excavated, cisterns backfilled and septic tanks/bunkers backfilled. Also includes typed logbook pages for each day and photographs.

Shannon & Wilson, Inc., October 1994, *Expedited Response Action, Phase 2, Field Activities Report, Hanford North Slope*, V-0307-01, Shannon & Wilson, Inc, Kennewick, Washington. Summarizes debris removal, well structures excavated, cisterns backfilled and septic tanks/bunkers backfilled. Also includes typed logbook pages for each day, photographs, and well construction logs and decommissioning report.

Shannon & Wilson, April 1994, *Geophysics Survey, 2,4-D Site Hanford North Slope*, V-0202-01, Shannon & Wilson, Seattle, Washington.

Smith, R. W. and M. J. Rhoades, August 24, 1994, *Results of Geophysical Survey, H-83-L Landfill, Hanford North Slope, Richland, Washington*, Harding Lawson Associates, Novato, California.

Smith, R. W. and M. J. Rhoades, September 2, 1994, *Results of Geophysical Surveys at Ten Potential Landfill Sites, Hanford North Slope, Richland, Washington*, Harding Lawson Associates.

Cascade Earth Sciences, Ltd., August 25, 1994, U.S. Army Corps of Engineers, 2,4-D Site Report, Cascade Earth Sciences, Ltd, Portland, Oregon.

October 1994

DOE-RL, 1994, Draft Interim Close-Out Report, North Slope (Wahluke Slope) Expedited Response Action, Hanford, Washington, DOE/RL-94-138 Draft A. Summarized all characterization and cleanup activities.

Spring 1995 and 1996; 1998

Revegetation of selected sites on North Slope (Reference Gano, K.A., A. L. Johnson, and J. K. Linville, 1999, *1999 Environmental Restoration Contractor Revegetation Monitoring Report*, BHI-01310, Bechtel Hanford, Inc. Richland, Washington.)

June 1995

DOE-RL, 1995, *Proposed Plan for the 100-IU-1, 100-IU-3, 100-IU-4, and 100-IU-5 Operable Units*, DOE/RL-95-60, Department of Energy, Richland, Washington. Summarized all previous work and identified preferred alternative for remediation of waste sties as the step before the Record of Decision.

March 1996

Ecology, EPA, and DOE, 1996, *Declaration of the Record of Decision, 100-IU-1, 100-IU-3, 100-IU-4, and 100-IU-5 Operable Units*, CCN 028346. Declared that the operable units met the cleanup criteria and that no further action was required

March 1997

Recreational user of the North Slope notified the EPA Seattle Office that he suspected 2,4-D contamination remained at the site (referenced in Ecology & DOE 1994).

May 1997

EPA investigated the 2,4-D site and took samples (referenced in Ecology & DOE 1994).

Lerch, J. A., 1997, *Sampling and Analysis Instruction for Engineering Study at Waste Site 600-104, 100-IU-3 Operable Unit*, CCN 0047586. Plan for additional sampling activities at 2,4-D disposal site based on initial EPA sampling.

Dronen, V. R., 1997, *Summary of Engineering Study at 100-IU-3 Operable Unit, Waste Site 600-104*, June 24, 1997, letter from V. R. Dronen, Bechtel Hanford, Inc, to O. C. Robertson, U.S. Department of Energy, CCN 048041. Presented results of sampling at 2,4-D site to determine extent of contamination

August 1997

Ecology and DOE, 1997, Action Memorandum, USDOE Hanford 100 Area NPL (2,4-D Burial Site), 0047608, Washington State Department of Ecology and U.S. Department of Energy, Richland, Washington..

1997

Lerch, J. A., 1998, *100-IU-3 Waste Site 600-104 Remediation Summary*, BHI-01116, Rev 1. Summarized remediation activities at the 2,4-D site and presented results for confirmatory samples

1998

Roy, R., 1998, *Report of the Preliminary Findings of the Level III Preacquisition Environmental Contaminants Survey for the Hanford North (Wahluke) Slope and the Arid Lands Ecology Reserve, Hanford Reservation, Washington*, U.S. Fish and Wildlife Service, Richland, Washington. Presented results and evaluation of USFWS sampling for DDT metabolites at North Slope and ALE waste sites

May 22, 1998 to June 20, 1998

EPA, 1998, Superfund Focus Sheet, Proposal for Partial Deletion from NPL of 100-IU-1 and 100-IU-3 Operable Units. One-page public announcement of the intent to delete these two OUs from the National Priorities List.

July 8, 1998

63 FR 36861, *Federal Register*, Vol. 63, No. 130, Wednesday, July 8, 1998, "Notice of partial deletion of the Hanford 100-Area (USDOE) Superfund site from the National Priorities List," United States Environmental Protection Agency, Washington, D.C. Formal notice of deletion from the NPL for these operable units.

April 15, 1999 to May 25, 1999

Linville, J. K., K. A. Gano, and S. G. Weiss, 1999, *Assessment of Residual DDE at Four Remediated Hanford Waste Sites, Richland, Washington*, BHI-01331, Rev. 0. Presented results of sampling at three North Slope sites (PSN-01, PSN-90, and H-06-LE) and the Horseshoe Landfill on the ALE Reserve.

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